

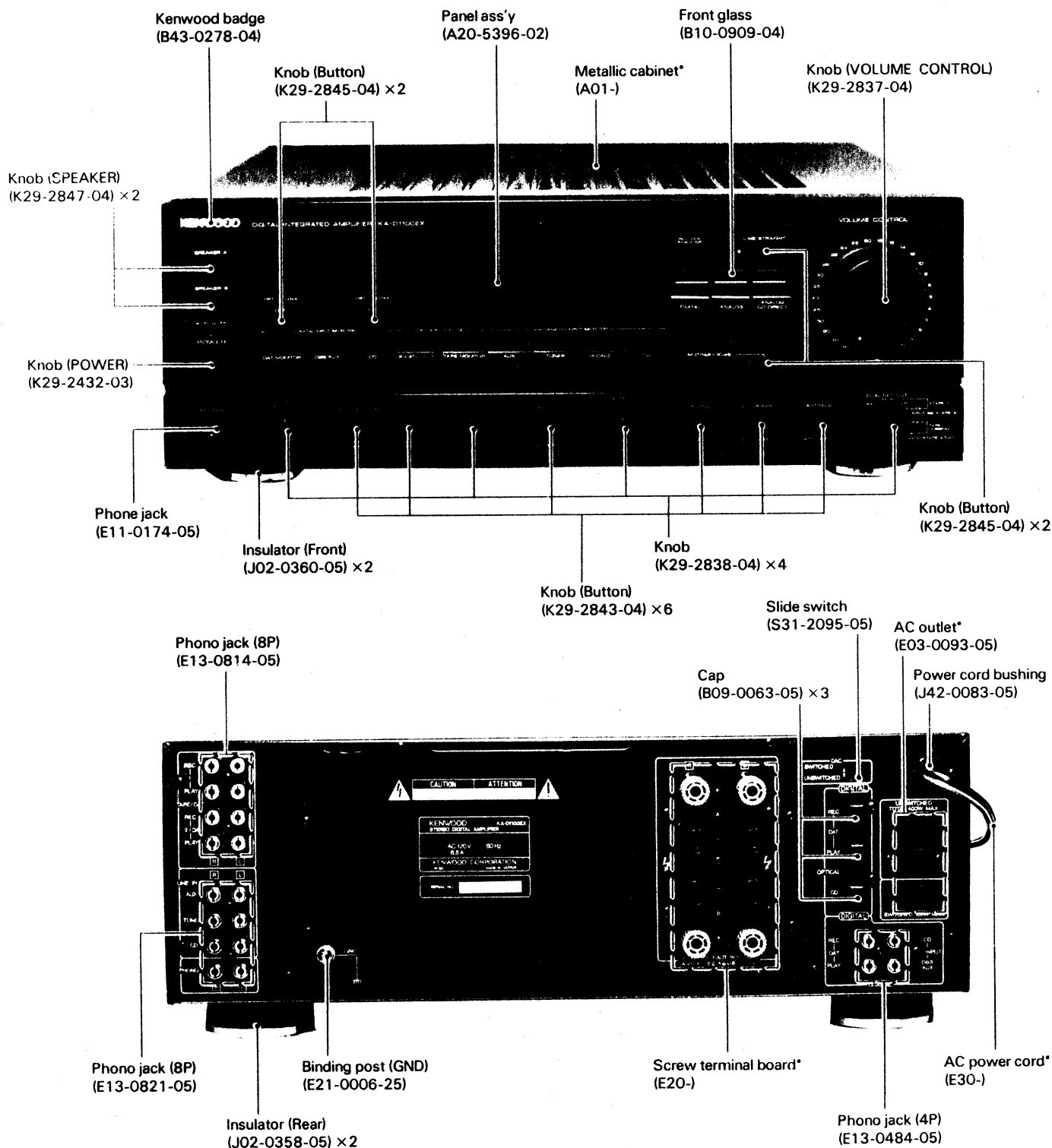
# DIGITAL INTEGRATED AMPLIFIER

# KA-D1100EX

## SERVICE MANUAL

# KENWOOD

C 1988-1 PRINTED IN JAPAN  
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\* Refer to Parts List on page 51.

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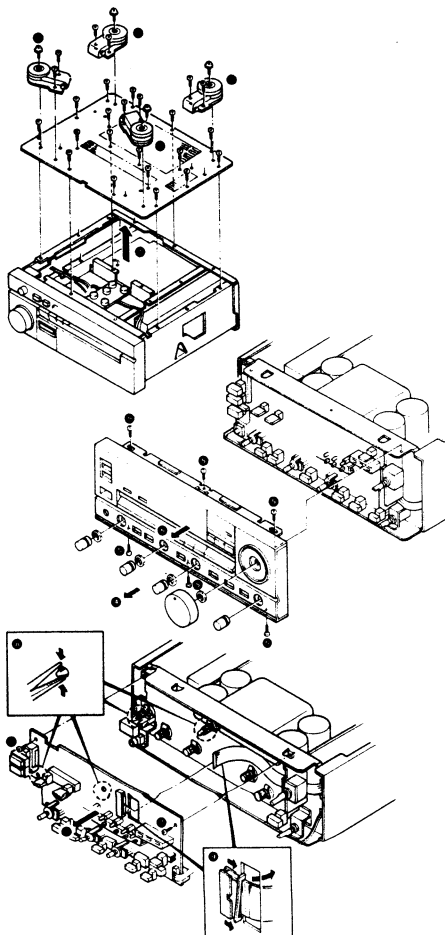
### CAUTION

Never connect an audio connection cord between the digital input/output jack and a PHONO, CD, TUNER, AUX or TAPE line input/output jack.

## DISASSEMBLY FOR REPAIR

(Remove the metallic cabinet from the body beforehand.)

1. Remove the 17 screws holding the bottom plate, and remove the bottom plate (1).
2. When removing the two insulators (J02-0360-05) at the front side, remove the three screws for each (2).
3. When removing the two insulators (J02-0358-05) at the rear, remove the three screws for each (3).

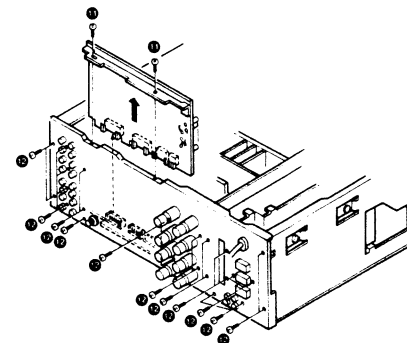


4. Remove the knobs and nuts for the BASS, TREBLE, BALANCE, DUAL REC OUT and VOLUME VRs (4).
5. Remove the six screws (three at the top, and three at the bottom) retaining the panel ass'y to the frame (5).
6. Remove the panel ass'y in the direction of the arrow (6).

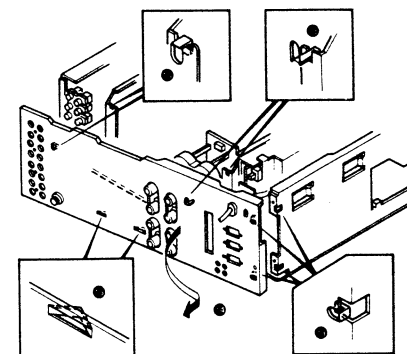
7. Remove the two screws retaining the Tone Unit (X11-2462-71) to the frame (7).
8. Remove the two unit holders retaining the Tone Unit (X11-) (8).
9. Remove the flexible cord from the CN1 of the Tone Unit (X11-) as shown in the figure (9).
10. Remove the Tone Unit (X11-) in the direction of the arrow (10).

## DISASSEMBLY FOR REPAIR

11. Remove the two screws retaining the Power Amplifier Unit (X07-2392-71) to the rear panel (11), and pull out the Power Amplifier Unit from the Audio Unit (X09-2562-71) (A/3).
12. Remove the 23 screws retaining the rear panel (12).



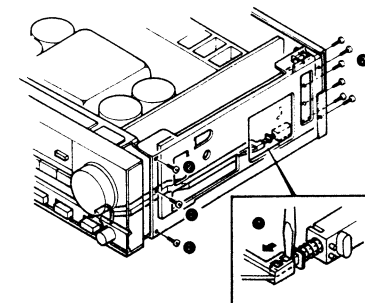
13. Taking cautious of the four lugs at the rear panel (13), remove the rear panel in the direction of the arrow (14).
14. When installing the rear panel to the body, carefully place the Audio Unit (X09-) (A/3) on the two lugs at the bottom of the rear panel (15).



### Disassembling the Pre-Amplifier Unit, Processor Unit and Digital I/O Unit

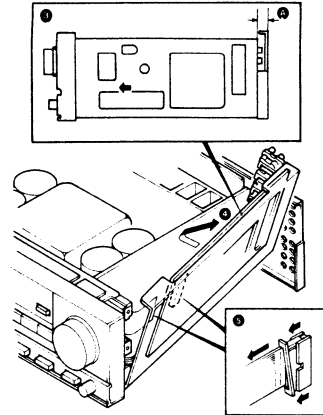
(Remove the metallic cabinet and bottom plate beforehand.)

1. After setting the CARTRIDGE switch to the "MM" position, remove the shaft as shown in the figure (1).
2. Remove the six screws retaining the rear panel, and the three screws retaining the side frames (2).

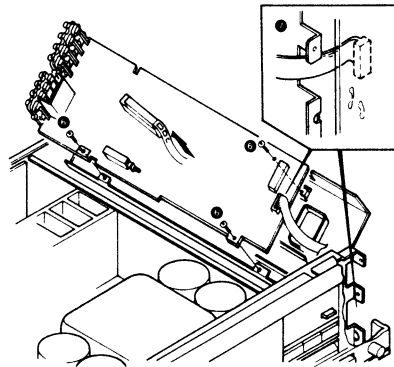


## DISASSEMBLY FOR REPAIR

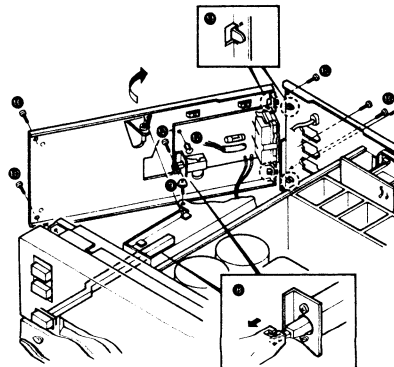
3. Slide the right side frame to that which the Pre-amplifier Unit (X08-222X-XX) (A/4) is attached so that there is a clearance at section (A) (3).
4. Lift the side frame diagonally in the direction of the arrow from the rear (4).
5. Remove the flexible cord from CN3 of the Pre-amplifier Unit (X08-) (A/4) (5).



6. Remove the three screws retaining the Pre-amplifier Unit (X08-) (A/4) to the side frame (6), and remove it in the direction of the arrow.
7. When installing the Pre-amplifier Unit (X08-) (A/4), first pass the flexible cord through the notch of the front frame so as not to get in the way of the front frame (7).

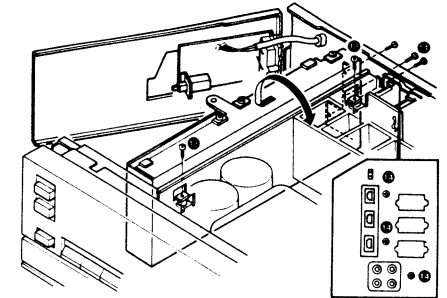


8. After confirming that the POWER switch is set to OFF, remove the shaft as shown in the figure (8).
9. Remove the screw retaining the left side frame (9).
10. Remove the four screws retaining the rear panel, and the two screws retaining the side frame (10).
11. Taking care of the two lugs on the rear panel (11), remove the side frame in the direction of the arrow.
12. Remove the push rivet and the screw retaining the Pre-amplifier Unit (X08-) (C/4) (12), to remove the Pre-amplifier Unit.

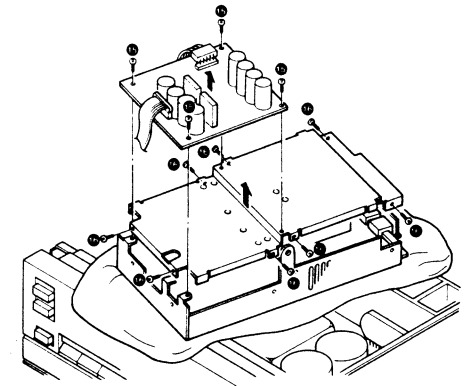


## DISASSEMBLY FOR REPAIR

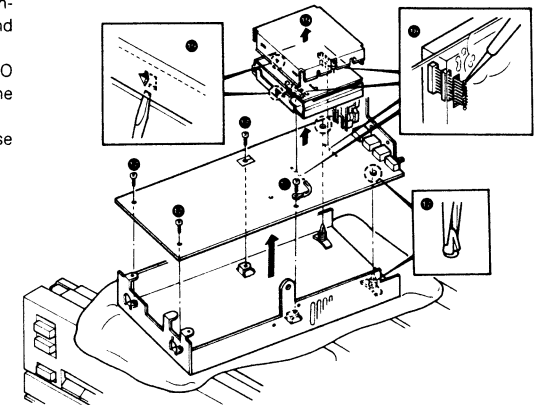
13. Remove the two screws retaining the DAC frame (13).
14. Remove the three screws retaining the DAC frame to the rear panel (14), and remove the Processor Unit (X32-1202-71) (A/2, B/2) with the frame in the direction of the arrow.



15. Spread a cloth on the top plate of the set, and place the Processor Unit (X32) (A/2, B/2) with the frame, then remove the four screws retaining the B/2 PC board to the frame (15) to remove the B/2 PC board.
16. Remove the eight screws retaining the shield plate (16) to remove it.

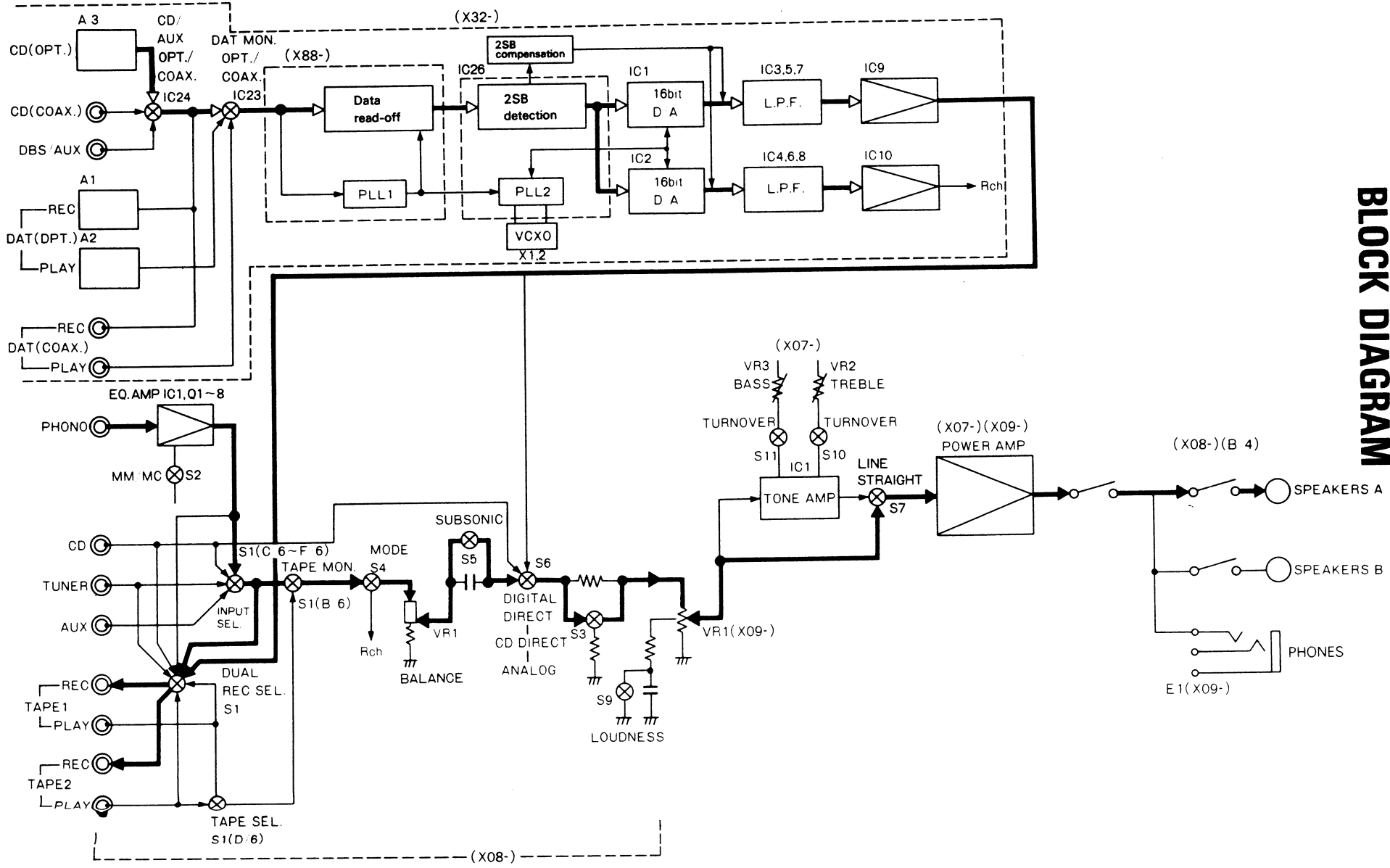


17. Remove the four screws and two unit holders retaining the Processor Unit (A/2) to the frame (17), and remove it in the direction of the arrow.
18. Unsolder the CN1 and CN2 holding the Digital I/O Unit (X88-1010-00) from the soldered surface of the Processor Unit (A/2) (18).
19. Remove the cover of the Digital I/O Unit (X88-) case by opening the lugs as shown in the figure (19).



# KA-D1100EX

## BLOCK DIAGRAM





## CIRCUIT DESCRIPTION

## AUDIO UNIT (X09-256X-XX)

Component	Use/Function	Operation/Condition/Interchangeability
Q1 ~6	Constant voltage circuit	Constant voltage circuit for main class A stage.
Q7, 8	Constant current circuit	Ripple elimination circuit inserted into the B line to the primary stage of class A.
Q9	For relay drive	
IC1, 2 (KAB02)	Power IC	
IC3, 4 (TA2030)	DLD switch IC	High/Low select circuit of DLD.

## TONE UNIT (X11-246X-XX)

Component	Use/Function	Operation/Condition/Interchangeability
Q1, 2	Winking circuit	The LED lights when the power indication and the set operates correctly, and blinks until the amplifier is operable (for about 5 seconds) after power is turned ON, or when the protection circuit functions because of the abnormal operation occurs in the power amplifier.
Q3	LED ON/OFF circuit for digital indication	
Q4	Lamp blinking prevention circuit	Constant voltage circuit for preventing the lamp from blinking when the power is output.
IC1 (NJM2041D-D)	IC for tone circuit	1/2 for L-channel, 2/2 for R-channel.

## PROCESSOR UNIT (X32-1202-71)

Component	Use/Function	Operation/Condition/Interchangeability
Q1, 2	Diode	
Q3, 4	Crystal oscillator	
Q5	LED driver	
Q6	Constant voltage power supply	
Q7	Constant voltage power supply	
Q8	Constant voltage power supply	
Q10 ~13	Relay control	
IC1, 2 (PCM56P-K)	For D/A conversion	
IC3, 4 (NJM5532D-D)	I-V conversion, addition for compensation of 2nd significant bit	Compatible with NE5532P, NJM5532D.
IC5 ~8 (NJM5532D-D)	Low pass filter	Compatible with NE5532P, NJM5532D.
IC9, 10 (NJM5532D-D)	Output amplifier	Compatible with NE5532P, NJM5532D.
IC21 (TC74HC04F)	Amplifier	
IC22 (TC74HC04F)	Inverter	
IC23, 24 (TC74HC153F)	Digital input select	
IC25 (SM5804D-T)	Digital filter	
IC26 (TC17G005AF-0053)	Twin quartz PLL control circuit Phase comparator for VCXO	
IC27 (M5223P)	Loop filter for VCXO	
IC28 (M5F78M05U)	Constant voltage power supply	Compatible with AN7805F.
IC29 (M5F79M05U)	Constant voltage power supply	Compatible with AN7905F.

## CIRCUIT DESCRIPTION

## Description of Components

## POWER AMPLIFIER UNIT (X07-239X-XX)

Component	Use/Function	Operation/Condition/Interchangeability
Q1, 2	Class A primary stage differential amplifier circuit	
Q3 ~6	Class A primary stage cascode circuit	
Q7, 8	Constant current circuit	Constant current circuit for class A primary stage differential amplifier circuit.
Q9 ~12	Class A secondary stage differential amplifier circuit	
Q13, 14	Class A cascode circuit	
Q15 ~18	Class A third stage differential amplifier circuit	
Q19, 20	Class A current mirror circuit	
Q21, 22	Class A cascode circuit	
Q23 ~30	Cascode bootstrap circuit	Consisting the VIG circuit, Q23 ~26 are constant current circuit, and Q27 ~30 are base ground.
Q31 ~34	For pre-driver	
Q35 ~38	For driver	
Q39 ~42	Cascode bootstrap circuit	Consisting the VIG circuit, Q39 ~42 are buffers.
Q43 ~46	Current limiter	Limits the current supplied to the final transistor when overload driven.
Q71	Constant voltage circuit	Transmits the operation signal of the current limiter Q43 and 44 to the protection IC (IC1).
IC1 ( $\mu$ PC1237HA)	Protection IC	

## PRE-AMPLIFIER UNIT (X08-222X-XX)

Component	Use/Function	Operation/Condition/Interchangeability
Q1 ~4	EQ circuit primary stage differential amplifier	
Q5 ~8	EQ circuit primary stage cascode circuit	
Q9, 10	EQ circuit primary stage constant current circuit	
Q11, 12	For stabilized power supply regulator	
Q13	Deck oscillation prevention circuit	Oscillation prevention circuit against a loop when the deck is connected.
Q14, 15	For relay drive	
IC1 (NJM5532D)	Op amp for EQ circuit	
IC2 (M5218P)	Op amp for stabilized power supply for EQ	

# KA-D1100EX KA-D1100EX

## CIRCUIT DESCRIPTION

### PROCESSOR UNIT (X32-1202-71)

IC30 (M5F78M06L)	Constant voltage power supply	
IC31 (M5F79M06L)	Constant voltage power supply	
IC32 (PQ05R04)	Constant voltage power supply	
IC33 (M5220P)	Error amplifier for constant voltage power supply	Compatible with NJM4560D-N.
IC34 (TC74HC04F)	Amplifier	
IC35 (M51951ASL)	For resetting	

### DIGITAL I/O UNIT (X88-1010-00)

Component	Use/Function	Operation/Condition/Interchangeability
IC1 (TC17G014AF-0073)	Digital audio data decoding	
IC2 (SN74LS624N)	V.C.O. (Voltage controlled oscillator)	
IC3 (M5223P)	Loop filter for PLL	
IC4 (TC74HC04F)	Inverter	
IC5 (TC74HC123F)	Monostable multi vibrator	

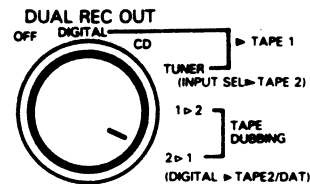
### DUAL REC OUT Switch and INPUT SELECTOR

#### Operations

On this amplifier, the REC 1 jacks and the REC 2 jacks are designed to have different tape recording functions. In principle, the REC 2 jacks output the signal from the source selected by the INPUT SELECTOR switches, while the REC 1 jacks output the signal from the source selected by the DUAL REC OUT switch. The relationship between the setting of these switches and the output signal is as shown in the following chart.

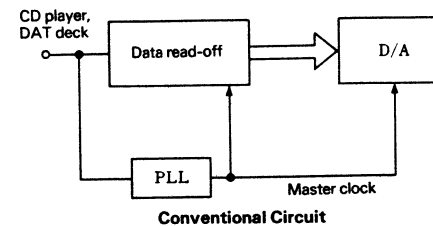
DUAL REC OUT SW position \ TAPE REC jacks	REC 1	REC 2
OFF	—	—
DIGITAL ► TAPE 1 (INPUT SEL ► TAPE 2)	DIGITAL SOURCE	ANALOG SOURCE
CD ► TAPE 1 (INPUT SEL ► TAPE 2)	CD	ANALOG SOURCE
TUNER ► TAPE 1 (INPUT SEL ► TAPE 2)	TUNER	ANALOG SOURCE
1 ► 2 TAPE DUBBING	ANALOG SOURCE	TAPE 1
2 ► 1 TAPE DUBBING (DIGITAL ► TAPE2/DAT)	TAPE 2	DIGITAL SOURCE

**Note:**  
In this chart, "source" shows the source signal selected by the INPUT SELECTOR switches.



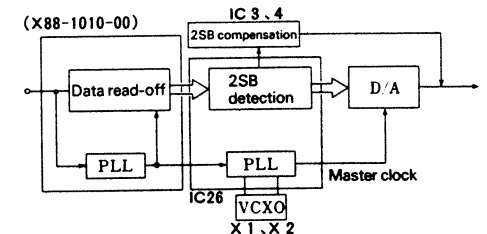
### Twinn Quartz PLL (X32-1202-71)

In the conventional circuits, as shown in the figure below, the master clock frequency is generated by PLL from the input digital signal, and the read-off of the data and transmission to the D/A converter are controlled using this clock frequency as a reference. However, improving the accuracy of the clock frequency is impossible if the data read-off speed is raised. A compromise is required.



In the newly developed circuit, as shown in the figure below, the exclusive PLLs are provided for read-off of data and for transmission to the D/A converter and they are connected in series. With this construction, each function is optimized, and highly accurate D/A conversion is made

possible since the PLL at the secondary stage is structured by the excessively stabilized crystal.



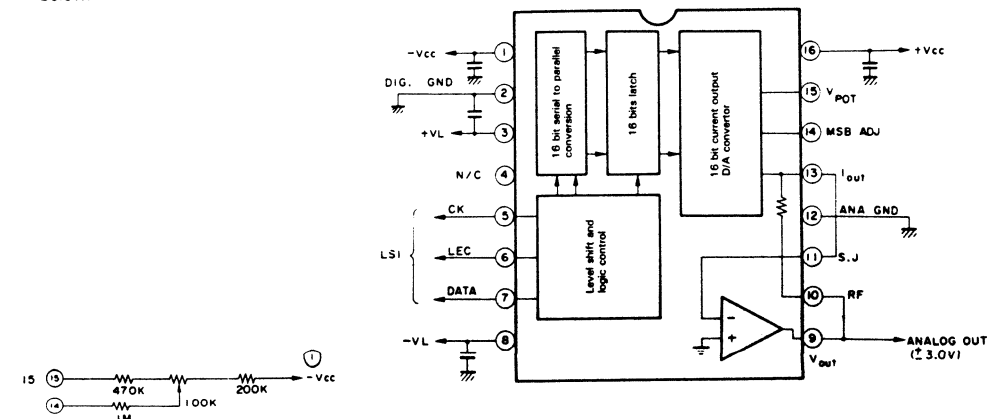
Twinn Quartz Circuit

For this new circuit, the exclusive ICs have developed so that two PLLs for the primary stage of data read-off section and for the secondary stage PLL section are structured in IC separately and effectively. Moreover, ICs consisting of the crystal PLL at the secondary stage have the function to compensate the MSB (most significant bit) and 2SB (2nd significant bit) with a timing of D/A conversion to eliminate the non-linear distortion of the D/A converter. This made a D/A conversion of extreme linearity possible.

### IC1, 2 (X32-1202-71): PCM56P-K

#### Operation Outline of D/A Unit

- The D/A converter IC1, 2: PCM56P-K is in the same rank as that used in the KA-3300D. Pin allocation, block diagram and timing diagram are shown in the figure below.



**Note:** The MSB error and differential linearity error with bipolar zero can be zero-adjusted by the external circuit shown below.

## CIRCUIT DESCRIPTION

Pin No.	Pin name	Function	Pin No.	Pin Name	Function
1	−Vcc	Analog negative power supply	9	Vout	Voltage output
2	DIG GND	Digital grounding	10	RF	Feedback resistance
3	+VL	Logic positive power supply	11	S.J	Summing junction (op amp input)
4	NC	No connection	12	ANA GND	Analog grounding
5	CK	Clock input	13	Iout	Current output
6	LEC	Latch enable control input	14	MSB ADJ	MSB adjustment pin
7	DATA	Data input	15	VPOT	Potentiometer pin
8	−VL	Logic negative power supply	16	+Vcc	Analog positive power supply

### Difference of Rank between PCM56P, PCM56P-J and PCM56P-K

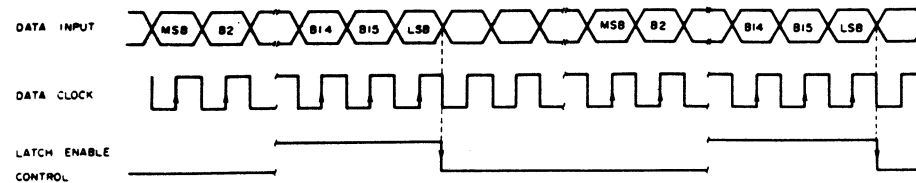
	PCM56P		PCM56P-J		PCM56P-K		Unit
	MIN		TYP		MAX		
Power voltage	±Vcc, ±VL (Note 1)	±4.75	±12.0		±13.2		V
Non-load supply	+Vcc (Vcc=+5.0V)		10		17		mA
current (Note 2)	−Vcc (Vcc=−5.0V)		−25		−35		mA
	+Vcc (Vcc=+12.0V)		12				mA
	−Vcc (Vcc=−12.0V)		−27				mA
Analog output (Bipolar model)							
Voltage output	Voltage range	±2.0	±3.0				V
	Output current						mA
	Output impedance		0.1				
	Current output		±1.0 (±30%)				mA
	Output impedance		1.2				K
	Output short-circuit period		Infinite to common mode				
Total harmonic distortion		TYP	MAX	TYP	MAX	TYP	MAX
Vo=FS at f=991Hz		0.002	0.008	0.002	0.004	•	0.0025
Vo=−20dB at f=991Hz		0.02	0.04	•	•	•	0.02
Vo=−60dB at f=991Hz		1.8	4.0	•	•	•	2.0

**Note 1:** Since the −Vcc is sub-straight connected, the potential of −Vcc should be set at equal to or lower than −VL.

**Note 2:** Shows the value when ±Vcc±VL (logic) is commonly connected.

**Note 3:** (•) shows the same rank as that at the left.

### Timing Diagram



- The data format is 2's complement, MSB-first.
- Data is latched in the shift register at the rise of data clock.
- Latch enable control is performed by the frequency twice the L/R clock, and the LSB corresponds to its rise.

## CIRCUIT DESCRIPTION

### IC23, 24 (X32-1202-71): TC74HC153F

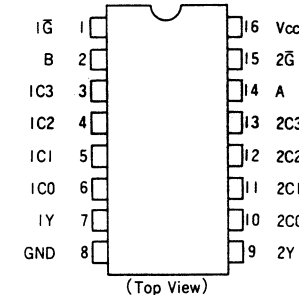
#### 4 Channel MPX

#### Absolute maximum rating

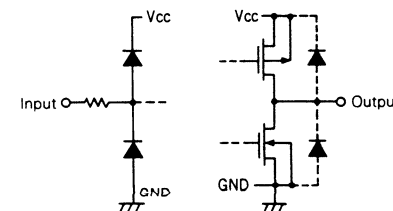
Item	Symbol	Specifications	Unit
Power voltage	Vcc	0.5~7	V
Input voltage	VIN	−0.5~Vcc+0.5	V
Output voltage	VOUT	−0.5~Vcc+0.5	V
Input protection diode current	Iik	±20	mA
Output parasitic diode current	Iok	±20	mA
Output current	IOUT	±25	mA
Power supply/GND current	Icc	±50	mA
Allowable loss	Pd	500(DIP)/180(MFP)	mW
Storage temperature	TSTG	−65~150	°C
Leading temperature	TL	300	°C

\* Ta=500 mW between −40°C and +65°C. In the range Ta=65°C ~ 85°C, derating is required to 300 mW at −10 mW/°C.

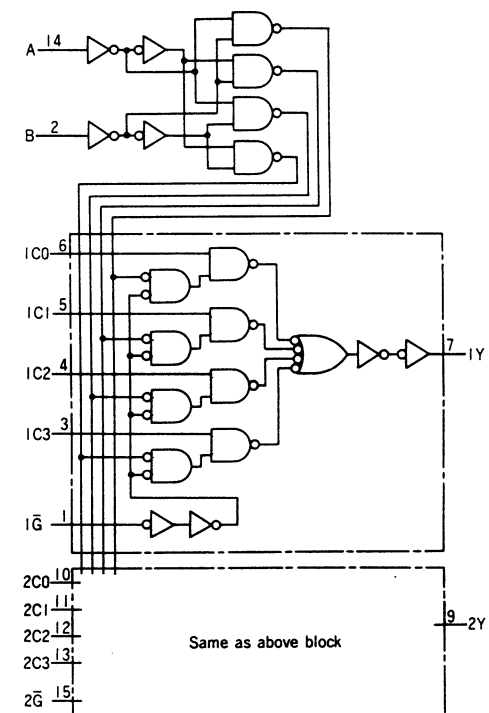
#### Pin connection



#### Input protection circuit, output equivalent circuit



#### Logic diagram



# KA-D1100EX

## CIRCUIT DESCRIPTION

Truth table

SELECT INPUTS		DATA INPUTS				STROBE	OUTPUT Y
B	A	C0	C1	C2	C3	$\overline{G}$	HC153
X	X	X	X	X	X	H	L
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

X: Don't care

Operation condition

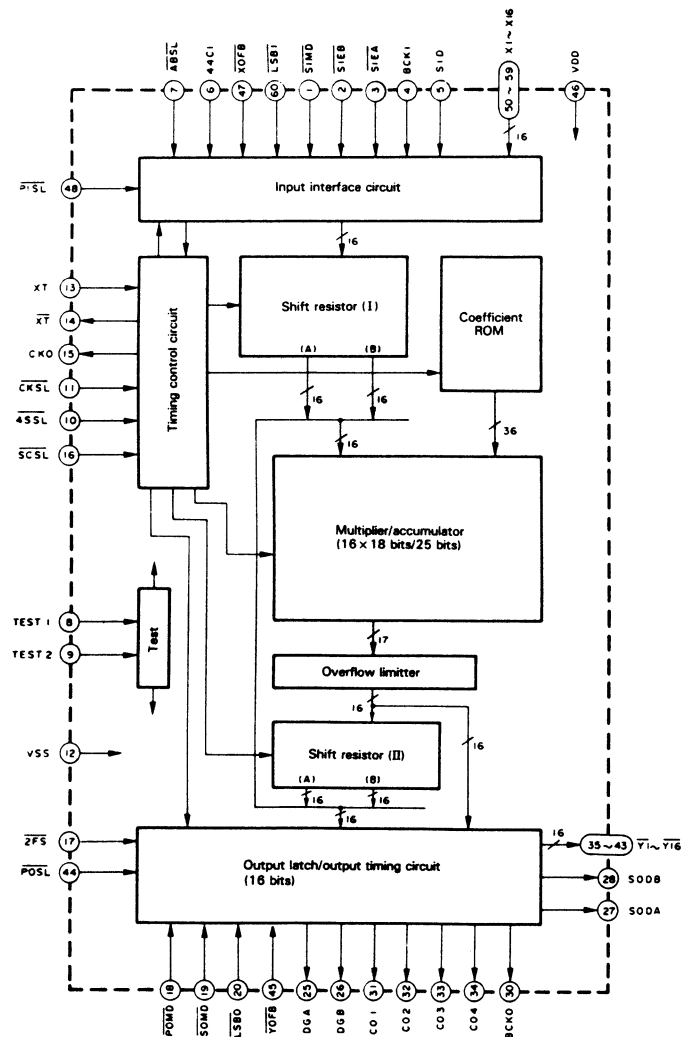
Item	Symbol	Specifications	Unit
Power voltage	Vcc	2～6	V
Input voltage	Vin	0～Vcc	V
Output voltage	Vout	0～Vcc	V
Operable temperature	ToPR	－40～85	°C
Input up/down period	tr, tf	0～1000 (Vcc=2.0V) 0～500 (Vcc=4.5V) 0～400 (Vcc=6.0V)	ns

## CIRCUIT DESCRIPTION

## IC25 (X32-1202-71):SM5804D-T

## Digital Filter LSI

## Block Diagram



Note: In the above diagram, the pin used for two functions are treated as two separate terminals.

## CIRCUIT DESCRIPTION

## Explanation of Pins

With this LSI, the switching between the serial and parallel inputs/outputs is performed by the PISL and POSL pins. Some

of the functions of pins X1 to X16 and Y1 to Y16 may be changed by this switching.

All the terminals of this unit function with PISL = H.

Note: Ip designates an input jack with a pull-up resistor.

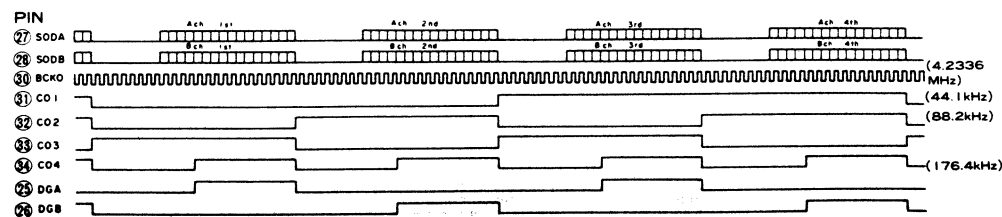
Pin No.	PISL = H		PISL = L		Function
	Pin Name	I/O	Pin Name	I/O	
1	SIMD	ip			Serial input mode switching.
			X5	ip	Parallel data input (Bit 5).
2	SIEB	ip			B CH serial input enable.
			X4	ip	Parallel data input (Bit 4).
3	SIEA	ip			A CH serial input enable.
			X3	ip	Parallel data input (Bit 3).
4	BCKI	ip			Serial input bit clock input.
			X2	ip	Parallel data input (Bit 2).
5	SID	ip			Serial input data.
			X1	ip	Parallel data input (LSB).
6	44CI	ip		ip	44.1 kHz sync clock input.
7	ABSL	ip		ip	ABSL = H → 44 CI clock, H/L = A CH/B CH. ABSL = L → 44 CI clock, H/L = B CH/A CH.
8	TEST 1	ip		ip	Test input 1 (Normally Open).
9	TEST 2	ip		ip	Test input 2 (Normally Open).
10	4SSL	ip		ip	Normally 4SSL = H or Open. 4SSL = L when input is 16.9344 MHz or 17.2872 MHz.
11	CKSL	ip		ip	CKSL = H → External clock input. CKSL = L → X'tal oscillation.
12	Vss				GND power supply pin (0 V).
13	XT	I		I	CKSL = H → Clock input. CKSL = L → X'tal oscillation input.
14	XT	O		O	CKSL = H → (Open). CKSL = L → X'tal oscillation output.
15	CKO	O		O	Clock output.
16	SCSL	ip		ip	System clock 96 fs → SCSL = H. System clock 98 fs → SCSL = L.
17	2FS	ip		ip	Open.
18	POMS	ip		ip	POMS = H → Normal parallel output mode. POMS = L → In-phase parallel output mode.
19	SOMD	ip		ip	SOMD = L with serial output.
20	LSBO	ip		ip	LSBO = H → MSB-first serial output. LSBO = L → LSB-first serial output.
21	(NC)				(NC)
22	(NC)				(NC)
23	(NC)				(NC)
24	(NC)				(NC)
25	DGA	O		O	A CH deglitch control output.
26	DGB	O		O	B CH deglitch control output.
27	SODA	O			A CH serial data output.
			Y1	O	Parallel output (inverted, LSB).

## CIRCUIT DESCRIPTION

Pin No.	PISL = H		PISL = L		Function
	Pin Name	I/O	Pin Name	I/O	
28	SODB	O			B CH serial data output.
			$\overline{Y2}$	O	Parallel output (inverted, Bit 2).
29	(NC)				Internally short-circuited to V <sub>DD</sub> . Not to be connected externally.
30	BCKO	O			Serial output bit clock output.
			$\overline{Y3}$	O	Parallel output (inverted, Bit 3).
31	CO1	O			Serial output control clock 1.
			$\overline{Y4}$	O	Parallel output (inverted, Bit 4).
32	CO2	O			Serial output control clock 2.
			$\overline{Y5}$	O	Parallel output (inverted, Bit 5).
33	CO3	O			Serial output control clock 3.
			$\overline{Y6}$	O	Parallel output (inverted, Bit 6).
34	CO4	O			Serial output control clock 4.
			$\overline{Y7}$	O	Parallel output (inverted, Bit 7).
35	(NC)	Hz			(NC)
			$\overline{Y8}$	O	Parallel output (inverted, Bit 8).
36	(NC)	Hz			(NC)
			$\overline{Y9}$	O	Parallel output (inverted, Bit 9).
37	(NC)	Hz			(NC)
			$\overline{Y10}$	O	Parallel output (inverted, Bit 10).
38	(NC)	Hz			(NC)
			$\overline{Y11}$	O	Parallel output (inverted, Bit 11).
39	(NC)	Hz			(NC)
			$\overline{Y12}$	O	Parallel output (inverted, Bit 12).
40	(NC)	Hz			(NC)
			$\overline{Y13}$	O	Parallel output (inverted, Bit 13).
41	(NC)	Hz			(NC)
			$\overline{Y14}$	O	Parallel output (inverted, Bit 14).
42	(NC)	Hz			(NC)
			$\overline{Y15}$	O	Parallel output (inverted, Bit 15).
43	(NC)	Hz			(NC)
			$\overline{Y16}$	O	Parallel output (inverted, MSB).
44	POS $\overline{L}$	ip		ip	POS $\overline{L}$ = H → Serial output system. POS $\overline{L}$ = L → Parallel output system.
45	YOFB	ip		ip	YOFB = H → 2's complement display output. YOFB = L → Offset binary display output.
46	V <sub>DD</sub>				+ve power supply pin (5 V).
47	XOFB	ip		ip	XOFB = H → 2's complement display input. XOFB = L → Offset binary display input.
48	PISL	ip		ip	PISL = H → Serial input system. PISL = L → Parallel input system.
49	(NC)				(NC)

## CIRCUIT DESCRIPTION

Pin No.	PISL = H		PISL = L		Function
	Pin Name	I/O	Pin Name	I/O	
50	(NC)	ip			(NC)
			X16	ip	Parallel data input (MSB).
51	(NC)	ip			(NC)
			X15	ip	Parallel data input (Bit 15).
52	(NC)	ip			(NC)
			X14	ip	Parallel data input (Bit 14).
53	(NC)	ip			(NC)
			X13	ip	Parallel data input (Bit 13).
54	(NC)	ip			(NC)
			X12	ip	Parallel data input (Bit 12).
55	(NC)	ip			(NC)
			X11	ip	Parallel data input (Bit 11).
56	(NC)	ip			(NC)
			X10	ip	Parallel data input (Bit 10).
57	(NC)	ip			(NC)
			X9	ip	Parallel data input (Bit 9).
58	(NC)	ip			(NC)
			X8	ip	Parallel data input (Bit 8).
59	(NC)	ip			(NC)
			X7	ip	Parallel data input (Bit 7).
60	$\overline{LSBI}$	ip			$\overline{LSBI}$ = H → MSB-first serial input. $\overline{LSBI}$ = L → LSB-first serial input.
			X6	ip	Parallel data input (Bit 6).

Serial Output Timing (SOD $\overline{M}$  = L,  $\overline{SCSL}$  = H, system clock = 4.2336 MHz)

## CIRCUIT DESCRIPTION

IC26 (X32-1202-71): TC17G005AF-0053

Twin Quartz PLL Control Circuit  
Phase Comparator for VCXO

## Maximum rating

(V<sub>SS</sub>=0V)

Item	Symbol	Specifications	Unit
Power voltage	VDD	VSS-0.3~VSS+7.0	V
Input voltage	V <sub>IN</sub>	VSS-0.3~VDD+0.3	V
Input current	I <sub>IN</sub>	±20	mA
Storage temperature	T <sub>stg</sub>	-40~125	°C

## Operation condition

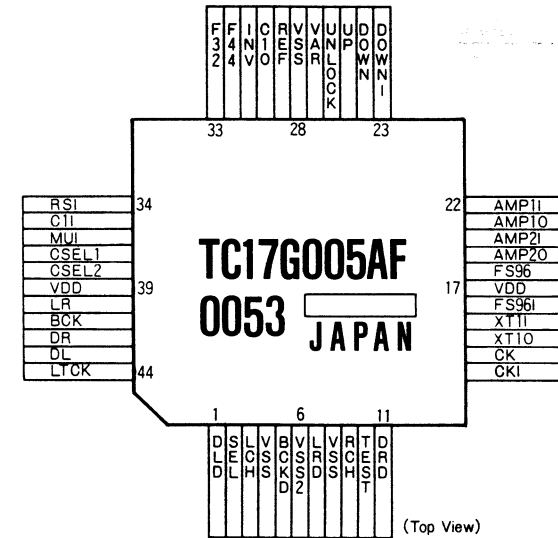
Item	Symbol	Specifications	Unit
Power voltage	VDD	4.75~5.25	V
Operable temperature	T <sub>a</sub>	0~70	°C

## Electrical characteristics under permissible operating condition

Symbol	Item	Buffer Name	Condition	Min	Typ	Max	Unit
V <sub>IH</sub>	High-level input voltage	SMT1	—	4.0	—	—	V
		SMT1U	—	4.0	—	—	V
		SMT1D	—	4.0	—	—	V
		IBUF	—	3.5	—	—	V
		INPAD(IBUFBI)	—	3.5	—	—	V
V <sub>IL</sub>	Low-level input voltage	SMT1	—	—	—	1.0	V
		SMT1U	—	—	—	1.0	V
		SMT1D	—	—	—	1.0	V
		IBUF	—	—	—	1.5	V
		INPAD(IBUFBI)	—	—	—	1.5	V
V <sub>OH</sub>	High-level output voltage	B1	I <sub>OH</sub> =-4.0 (mA)	2.4	—	—	V
		B18	I <sub>OH</sub> =-2.0 (mA)	2.4	—	—	V
		BTS7B	I <sub>OH</sub> =-4.0 (mA)	2.4	—	—	V
V <sub>OL</sub>	Low-level output voltage	B1	I <sub>OL</sub> =4.0 (mA)	—	—	0.4	V
		B18	I <sub>OL</sub> =2.0 (mA)	—	—	0.4	V
		BTS7B	I <sub>OL</sub> =4.0 (mA)	—	—	0.4	V
I <sub>IH</sub>	High-level input current	SMT1	V <sub>IN</sub> =VDD	—	—	10	μA
		SMT1U	V <sub>IN</sub> =VDD	—	—	10	μA
		SMT1D	V <sub>IN</sub> =VDD	—	—	200	μA
		IBUF	V <sub>IN</sub> =VDD	—	—	10	μA
		INPAD(IBUFBI)	V <sub>IN</sub> =VDD	—	—	10	μA
I <sub>IL</sub>	Low-level input current	SMT1	V <sub>IN</sub> =VSS	-10	—	—	μA
		SMT1U	V <sub>IN</sub> =VSS	-200	—	—	μA
		SMT1D	V <sub>IN</sub> =VSS	-10	—	—	μA
		IBUF	V <sub>IN</sub> =VSS	-10	—	—	μA
		INPAD(IBUFBI)	V <sub>IN</sub> =VSS	-10	—	—	μA
I <sub>OZ</sub>	Output leakage current	—	V <sub>OUT</sub> =VDD, VSS	-10	—	10	μA
I <sub>DD(S)</sub>	Static consuming current	—	V <sub>IN</sub> =VDD, VSS	—	15	—	μA
I <sub>DD(D)</sub>	Consuming current	—	—	—	20	—	mA

## CIRCUIT DESCRIPTION

## Terminal connection diagram



## Terminal description

Pin No.	Pin Name	Buffer Name	I/O	Pin No.	Pin Name	Buffer Name	I/O
1	DLD	B18	O	23	DOWN I	B1	O
2	SEL	SMT1	I	24	DOWN	B1	O
3	LCH	B18	O	25	UP	B1	O
4	VSS	—	—	26	UNLOCK	SMT1	I
5	BCKD	B18	O	27	VAR	B18	O
6	VSS2	—	—	28	VSS	—	—
7	LRD	B18	O	29	REF	SMT1	I
8	VSS	—	—	30	C10	B18	O
9	RCH	B18	O	31	INV	SMT1	I
10	TEST	SMT1D	I	32	F44	SMT1	I
11	DRD	B18	O	33	F32	SMT1	I
12	CKI	B1	O	34	RSI	SMT1U	I
13	CK	B1	O	35	C11	SMT1	I
14	XT10	BTS7B	O	36	MUI	SMT1U	I
15	XT11	INPAD	I	37	CSEL1	SMT1	I
16	FS96I	B18	O	38	CSEL2	SMT1	I
17	VDD	—	—	39	VDD	—	—
18	FS96	B18	O	40	LR	SMT1	I
19	AMP20	BTS7B	O	41	BCK	SMT1	I
20	AMP2I	IBUF	I	42	DR	SMT1	I
21	AMP10	BTS7B	O	43	DL	SMT1	I
22	AMP1I	IBUF	I	44	LTCK	SMT1	I

CIRCUIT DESCRIPTION

IC1 (X88-1010-00): TC17G014AF-0073  
Digital Audio Data Decoding IC

Maximum rating (VSS=0V)

Item	Symbol	Specifications	Unit
Power voltage	VDD	VSS-0.3~VSS+7.0	V
Input voltage	Vin	VSS-0.3~VDD+0.3	V
Input current	Iin	±20	mA
Storage temperature	Tstg	-40~125	°C

Operation condition

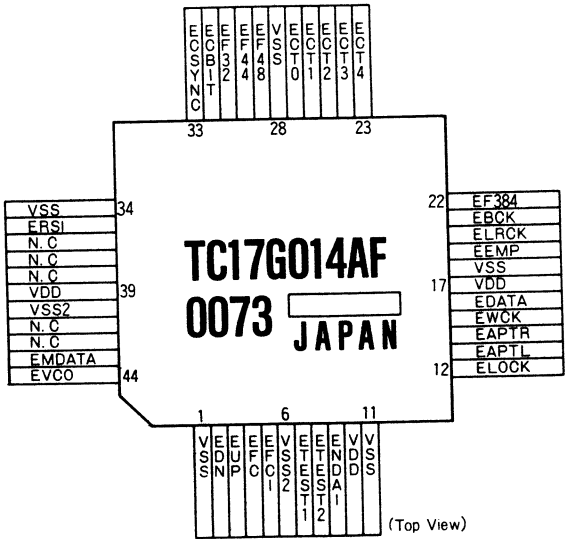
Item	Symbol	Specifications	Unit
Power voltage	VDD	4.75~5.25	V
Operable temperature	Ta	0~70	°C

Electrical characteristics under permissible operating condition

Symbol	Item	Buffer Name	Condition	Min	Typ	Max	Unit
VIH	High-level input voltage	SMT1	—	4.0	—	—	V
		SMT1U	—	4.0	—	—	V
		SMT1D	—	4.0	—	—	V
VIL	Low-level input voltage	SMT1	—	—	—	1.0	V
		SMT1U	—	—	—	1.0	V
		SMT1D	—	—	—	1.0	V
VOH	High-level output voltage	B1	IOH=-4.0 (mA)	2.4	—	—	V
		BTS1	IOH=-4.0 (mA)	2.4	—	—	V
		BTS18	IOH=-2.0 (mA)	2.4	—	—	V
VOL	Low-level output voltage	B1	IOL=4.0 (mA)	—	—	0.4	V
		BTS1	IOL=4.0 (mA)	—	—	0.4	V
		BTS18	IOL=2.0 (mA)	—	—	0.4	V
IIH	High-level input current	SMT1	VIN=VDD	-10	—	10	μA
		SMT1U	VIN=VDD	-10	—	10	μA
		SMT1D	VIN=VDD	10	—	200	μA
IIL	Low-level input current	SMT1	VIN=VSS	-10	—	10	μA
		SMT1U	VIN=VSS	-200	—	-10	μA
		SMT1D	VIN=VSS	-10	—	10	μA
IOZ	Output leakage current	—	VOU=VDD, VSS	-10	—	10	μA
IDD(S)	Static consuming current	—	VIN=VDD, VSS	—	35	—	μA
IDD(I)	Consuming current	—	—	—	20	—	mA

CIRCUIT DESCRIPTION

Terminal connection diagram



Terminal description

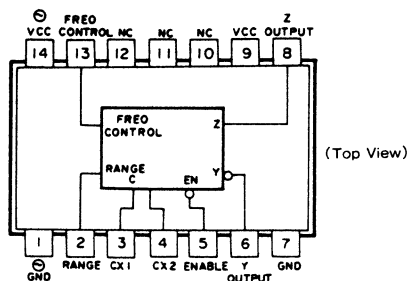
Pin No.	Pin Name	Buffer Name	I/O	Pin No.	Pin Name	Buffer Name	I/O
1	VSS	—	—	23	ECT4	B1	O
2	EDN	BTS1	O	24	ECT3	B1	O
3	EUP	BTS1	O	25	ECT2	B18	O
4	EFC	BTS1	O	26	ECT1	B18	O
5	EFCI	BTS1	O	27	ECT0	B18	O
6	VSS2	—	—	28	VSS	—	—
7	ETEST1	SMT1D	I	29	EF48	B18	O
8	ETEST2	SMT1D	I	30	EF44	B18	O
9	ENDAI	SMT1D	I	31	EF32	B18	O
10	VDD	—	—	32	ECBIT	B18	O
11	VSS	—	—	33	ECSYNC	B18	O
12	ELOCK	B1	O	34	VSS	—	—
13	EAPTL	BTS18	O	35	ERSI	SMT1U	I
14	EAPTR	BTS18	O	36	N.C	—	—
15	EWCK	BTS18	O	37	N.C	—	—
16	EDATA	BTS18	O	38	N.C	—	—
17	VDD	—	—	39	VDD	—	—
18	VSS	—	—	40	VSS2	—	—
19	EEMP	B1	O	41	N.C	—	—
20	ELRCK	BTS18	O	42	N.C	—	—
21	EBCK	BTS18	O	43	EMDATA	SMT1	I
22	EF384	B1	O	44	EVCO	SMT1	I



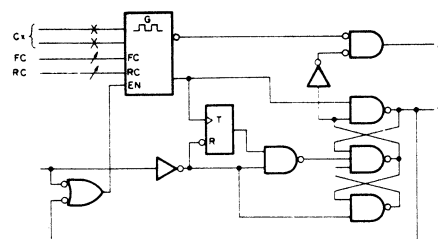
## CIRCUIT DESCRIPTION

IC2 (X88-1010-00): SN74LS624N  
Voltage Controlled Oscillator

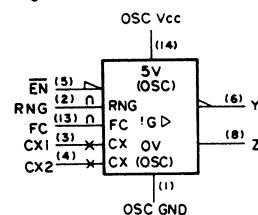
Terminal connection diagram and block diagram



Logic diagram



Logic symbol diagram

A1 (X32-1202-71): W02-0784-05  
Optical Transmission Module

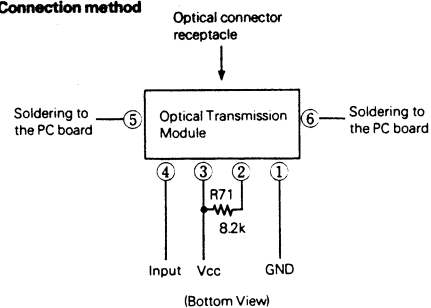
Outside view



Terminal connection

Pin No.	Connection
1	GND
2	Current regulation resistor of LED
3	Vcc
4	Input
5	NC
6	NC

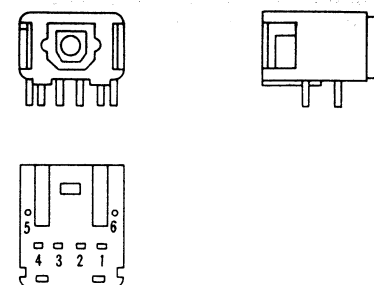
Connection method



## CIRCUIT DESCRIPTION

A2, 3 (X32-1202-71): W02-0774-05  
Optical Reception Module

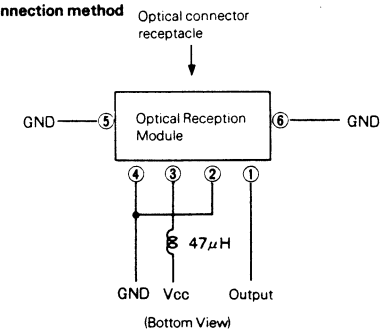
Outside view



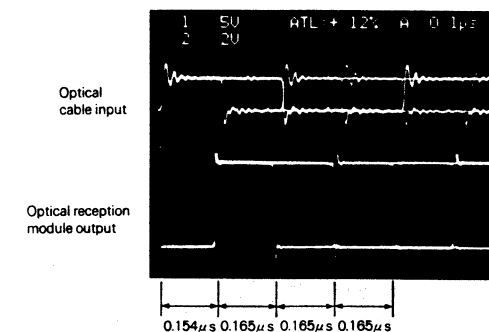
Terminal connection

Pin No.	Connection
1	Output
2	GND
3	Vcc
4	GND
5	Case
6	Case

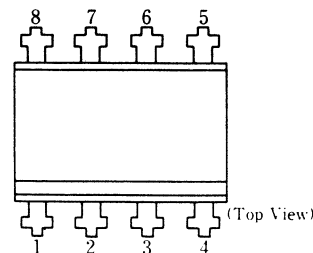
Connection method



Optical reception module output waveform

PH1 (X32-1202-71): T95-0101-05  
Photo Coupler

Outside view



Connection of electrode

1.3.	Anode (LED)
2.4.	Cathode (LED)
5.7.	Emitter (Photo transistor)
6.8.	Collector (Photo transistor)

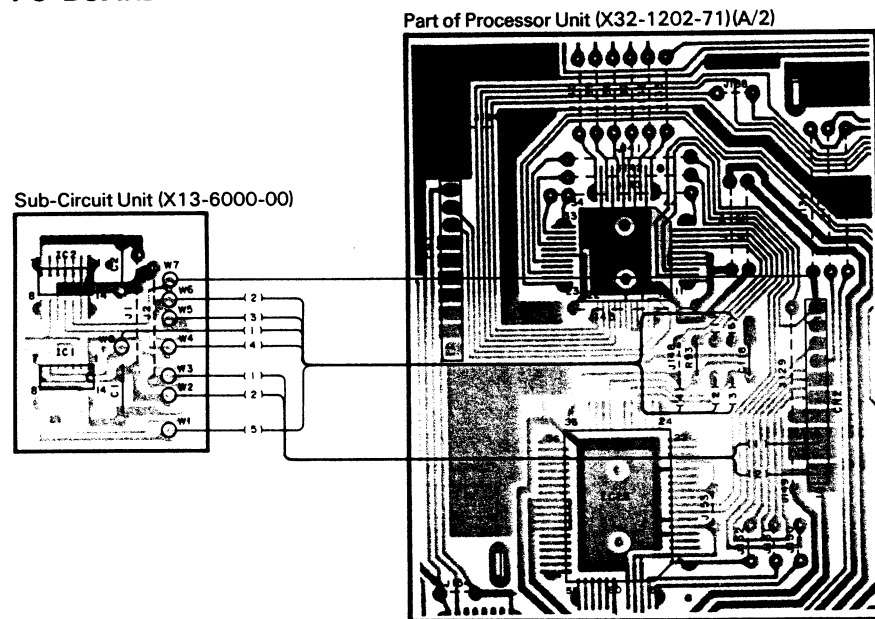
## CIRCUIT DESCRIPTION

### Products incorporating the small auxiliary unit

The units of this model produced in the period from October to December 1987 incorporate the small Sub-Circuit Unit (X13-6000-00) attached to the Processor Unit (X32-1202-71). When servicing these units, please refer to the following PC board diagram, circuit diagram and parts list.

With the units to be produced from January and on (S/No. 80100001 and after), the function of the small Sub-Circuit Unit will be accommodated in IC26 on the (X32-). Therefore, IC26 with current parts No. TC17G005AF-0048 will not be compatible with that with new parts No. TC17G005AF-0053. Note that the PC board diagrams, circuit diagrams and parts lists in this manual have been produced based on the units to be produced from January and on.

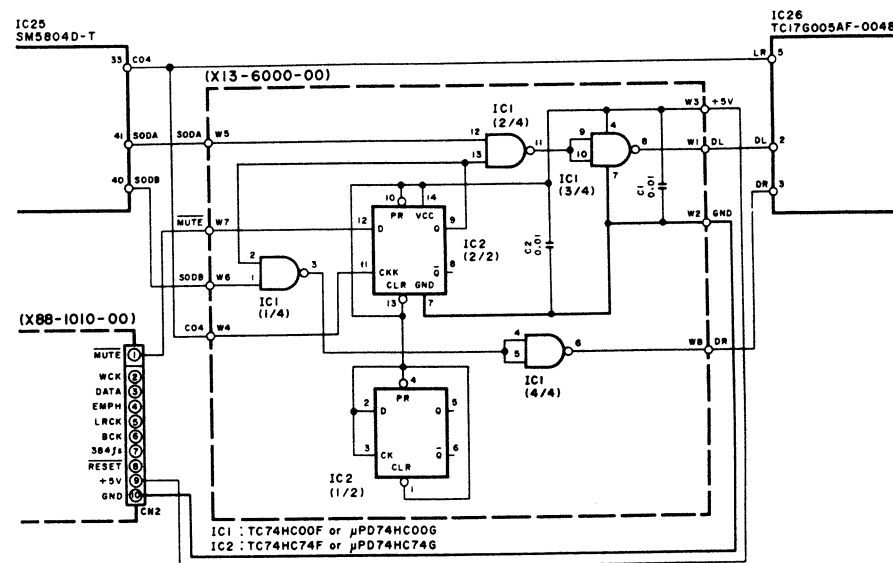
### PC BOARD



KA-D1100EX

## CIRCUIT DESCRIPTION

### SCHEMATIC DIAGRAM

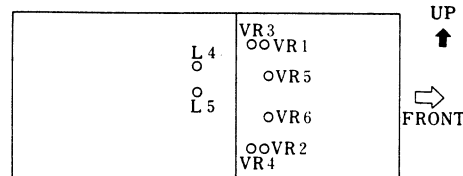
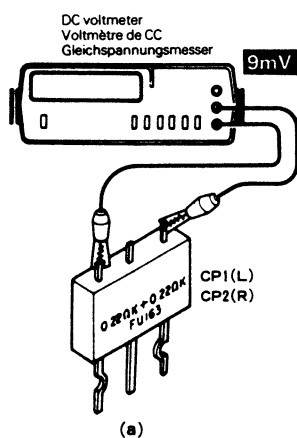


### PARTS LIST

Ref. No.	Address	New Parts	Parts No.	Description	Destination	Remarks
Sub-Circuit Unit (X13-6000-00)						
C1, 2			C91-0769-05	CERAMIC 0.01μF M		
IC1			TC74HC00F	IC (2CH NAND GATE)		
IC1			UPD74HC00G	IC (2CH NAND GATE)		
IC2			TC74HC74F	IC (D FLIP-FLOP)		
IC2			UPD74HC74G	IC (D FLIP-FLOP)		

## ADJUSTMENT

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
1	IDLE CURRENT	—	Connect a DC voltmeter across CP1 (L) CP2 (R). (X09-)	VOLUME: 0	VR1 (L) VR2 (R) (X07-)	9mV	(a)
2	VCXO (1)	Remove J107 and apply 2.5V DC to TP4. (X32-)	Connect a frequency counter to TP6. (X32-)	—	L5 (X32-)	Oscillation frequency: 18.9844MHz (After adjustment, attach J107 again.)	(b)
3	VCXO (2)	Remove J107 and apply 2.5V DC to TP4. (X32-)	Connect a frequency counter to TP5. (X32-)	—	L4 (X32-)	Oscillation frequency: 18.432MHz (After adjustment, attach J107 again.)	(c)
4	OUTPUT LEVEL ADJUSTMENT	Connect a digital SG or CD player to the digital input, and play a 1kHz, 0dB signal. (Test disc: SONY Type 4, T.No.2)	Connect a load of 10kΩ and AC voltmeter to REC OUT.	—	VR1, 2 (X32-)	Output level: 2V	
5	DISTORTION ADJUSTMENT	Connect a digital SG or CD player to the digital input, and play a 1kHz, 0dB signal. (Test disc: SONY Type 4, T.No.2)	Connect a load of 10kΩ and distortion meter to REC OUT.	—	VR3, 4 VR5, 6 (X32-)	Adjust VRs 3 and 4 (or VRs 5 and 6) alternately for a few times to minimize the distortion rate figure.	



ADJUSTING POINT OF THE PROCESSOR UNIT (X32-1200-00)

## REGLAGE

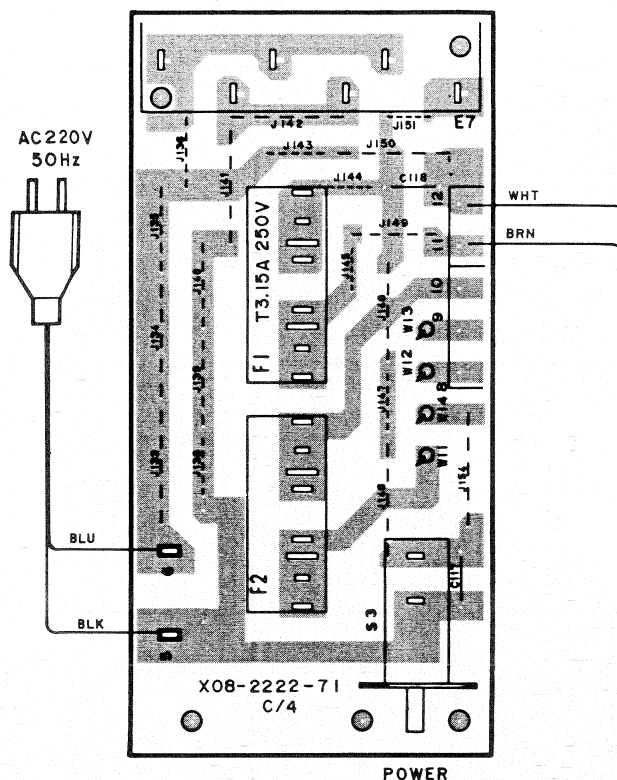
n°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DE L'AMPLIFICATEUR	POINT L'ALIGNEMENT	ALIGNER POUR	
1	COURANT DE POLARISATION	—	Connecter un voltmètre de CC sur CP1 (G) CP2 (D). (X09-)	VOLUME: 0	VR1 (G) VR2 (D) (X07-)	9mV	(a)
2	VCXO (1)	Retirer J107 et appliquer 2.5V CC à TP4. (X32-)	Relier un compteur de fréquence à TP6. (X32-)	—	L5 (X32-)	Fréquence d'oscillation: 18.9844MHz (Après l'ajustement, fixer J107 à nouveau.)	(b)
3	VCXO (2)	Retirer J107 et appliquer 2.5V CC à TP4. (X32-)	Relier un compteur de fréquence à TP5. (X32-)	—	L4 (X32-)	Fréquence d'oscillation: 18.432MHz (Après l'ajustement, fixer J107 à nouveau.)	(c)
4	ADJUSTEMENT DU NIVEAU DE SORTIE	Raccorder un générateur de signal numérique ou un lecteur CD à l'entrée numérique et lire un signal 1kHz, 0dB. (Disque test: SONY Type 4, Piste 2)	Raccorder une charge de 10kΩ et un voltmètre CA à REC OUT.	—	VR1, 2 (X32-)	Niveau de sortie: 2V	
5	ADJUSTEMENT DE LA DISTORSION	Raccorder un générateur de signal numérique ou un lecteur CD à l'entrée numérique et lire un signal 1kHz, 0dB. (Disque test: SONY Type 4, Piste 2)	Raccorder une charge de 10kΩ et un compteur de distorsion à REC OUT.	—	VR3, 4 VR5, 6 (X32-)	Ajuster les VR3 et 4 (ou 5 et 6) alternativement plusieurs fois pour minimiser le chiffre de taux de distorsion.	

## ABGLEICH

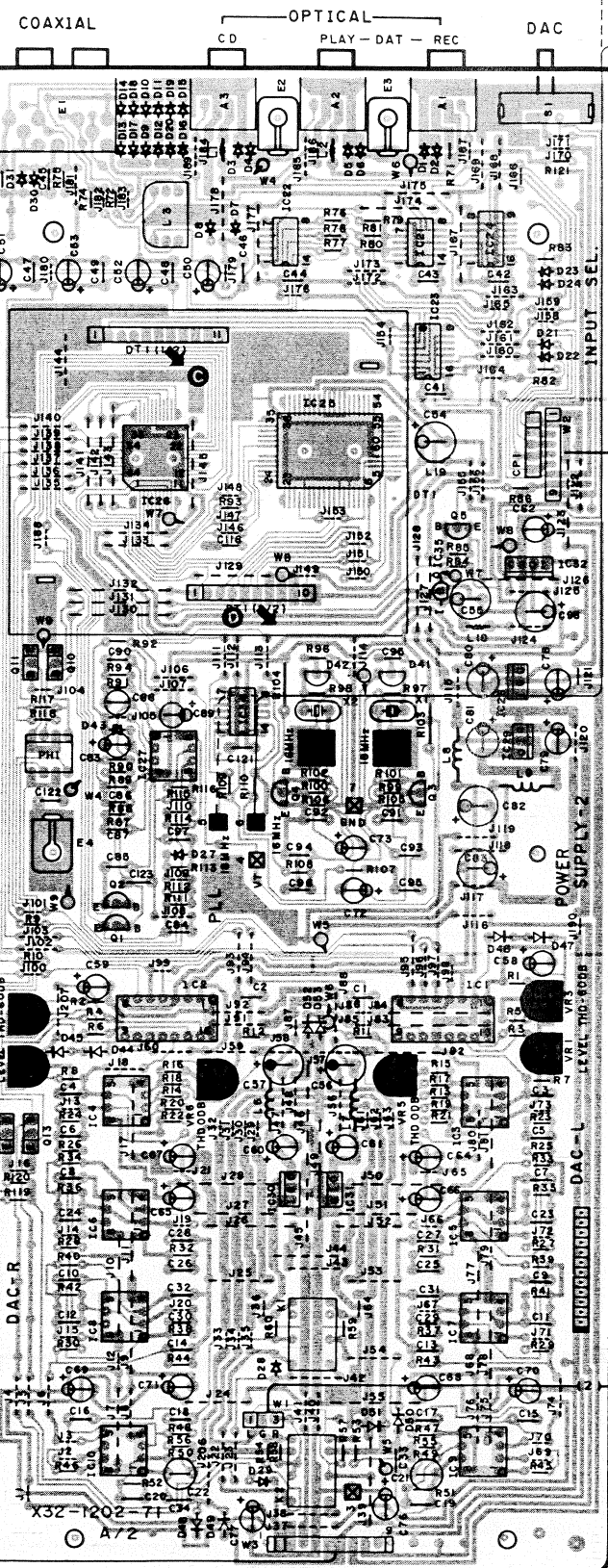
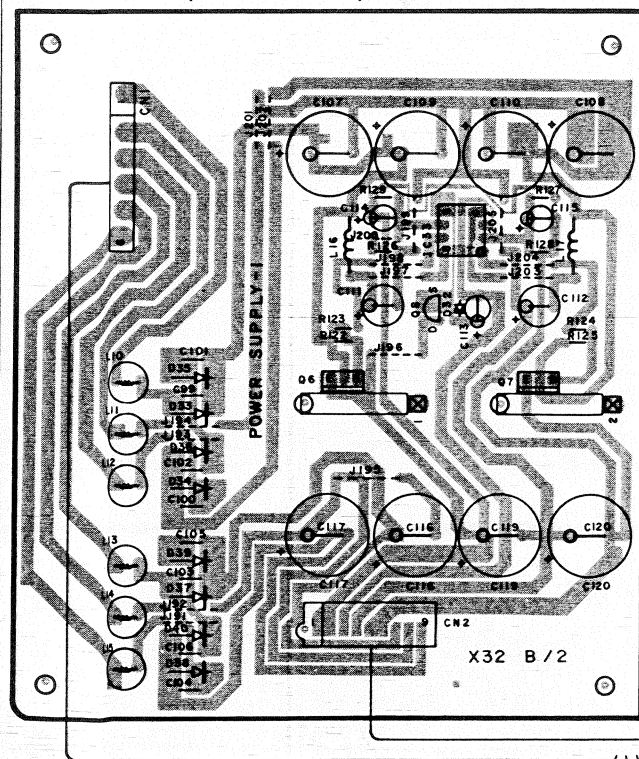
NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	VERSTÄRKER EINSTELLUNG	ABGLEICH-PUNKTE	ABGLEICHEN FÜR	ABB.
1	LEERLAUFSTROM	—	Einen Gleichspannungsmesser über CP1 (L) CP2 (R) anschließen. (X09-)	VOLUME: 0	VR1 (L) VR2 (R) (X07-)	9mV	(a)
2	VCXO (1)	J107 entfernen und 2,5V Gleichstrom an TP4 anlegen. (X32-)	Einen Frequenzzähler an TP6 anschließen. (X32-)	—	L5 (X32-)	Oszillationsfrequenz: 16,9844MHz (Nach der Einstellung J107 wieder anbringen.)	(b)
3	VCXO (2)	J107 entfernen und 2,5V Gleichstrom an TP4 anlegen. (X32-)	Einen Frequenzzähler an TP5 anschließen. (X32-)	—	L4 (X32-)	Oszillationsfrequenz: 18,432MHz (Nach der Einstellung J107 wieder anbringen.)	(c)
4	AUSGANGSPEGEL-EINSTELLUNG	Einen digitalen Signalgenerator oder CD-Spieler an den Digital-Eingang anschließen und ein 1kHz, 0dB Signal erzeugen. ( Testdisc: SONY Typ 4, Titel 2 )	Eine Last von 10kΩ und einen Wechselspannungsmesser an REC OUT anschließen.	—	VR1, 2 (X32-)	Ausgangspegel: 2V	
5	VERZERRUNGSEINSTELLUNG	Einen digitalen Signalgenerator oder CD-Spieler an den Digital-Eingang anschließen und ein 1kHz, 0dB Signal erzeugen. ( Testdisc: SONY Typ 4, Titel 2 )	Eine Last von 10kΩ und einen Verzerrungsmeter an REC OUT anschließen.	—	VR3, 4 VR5, 6 (X32-)	VR3 und 4 (oder VR5 und 6) mehrmals abwechselnd einstellen, um die Verzerrungsrate-Figur zu minimieren.	

# PC BOARD (Component Side View)

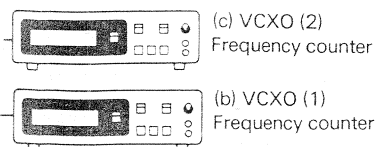
Pre-amplifier unit (X08-2222-71)



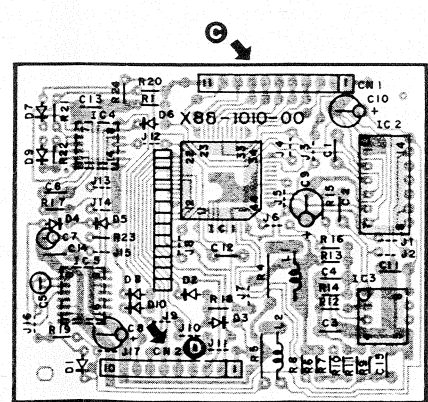
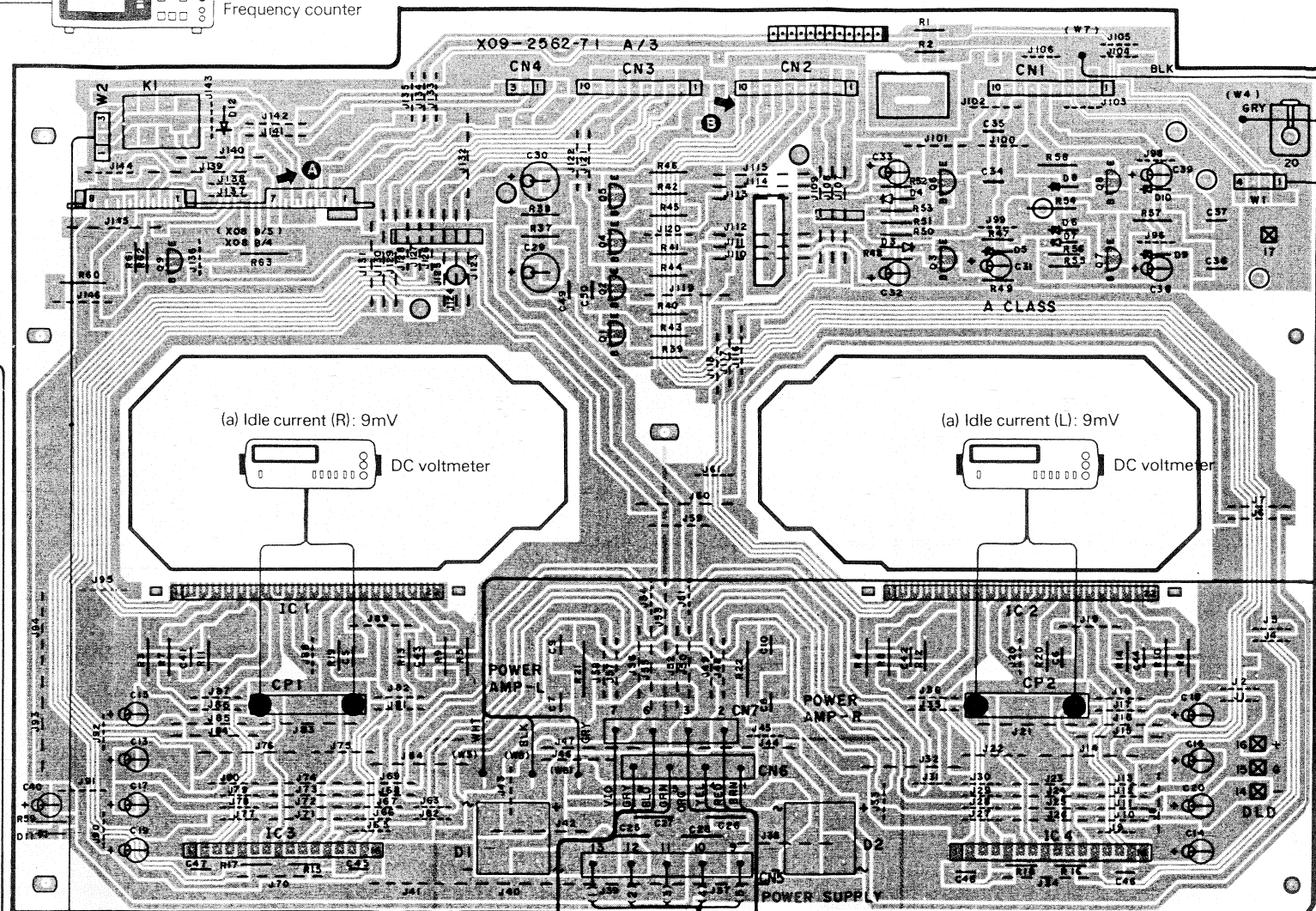
Processor unit (X32-1202-71)



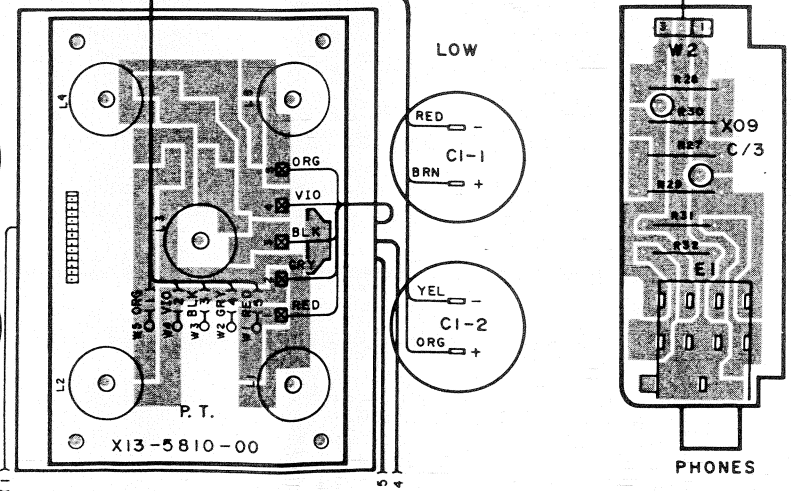
Processor unit (X32-1202-71)



Audio unit (X09-2562-71)



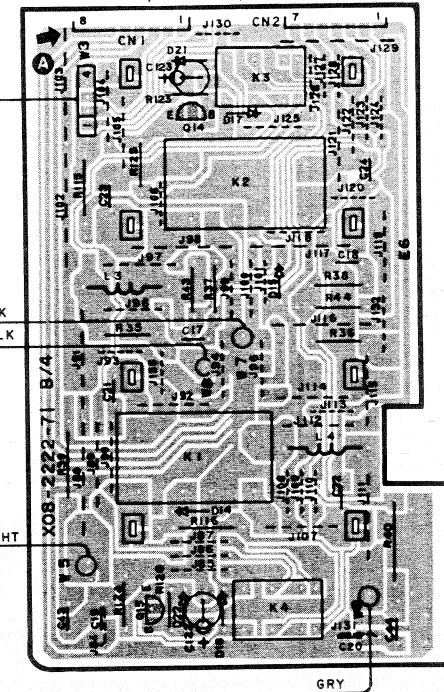
Digital I/O unit (X88-1010-00)



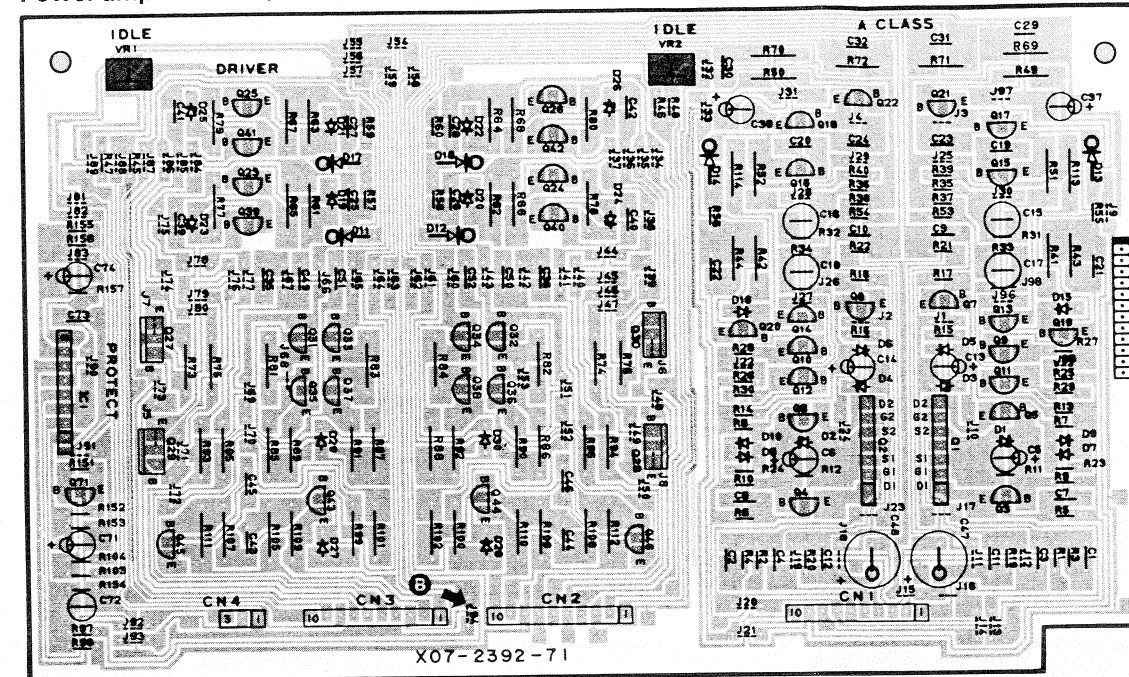
Sub-circuit unit (X13-5810-00)



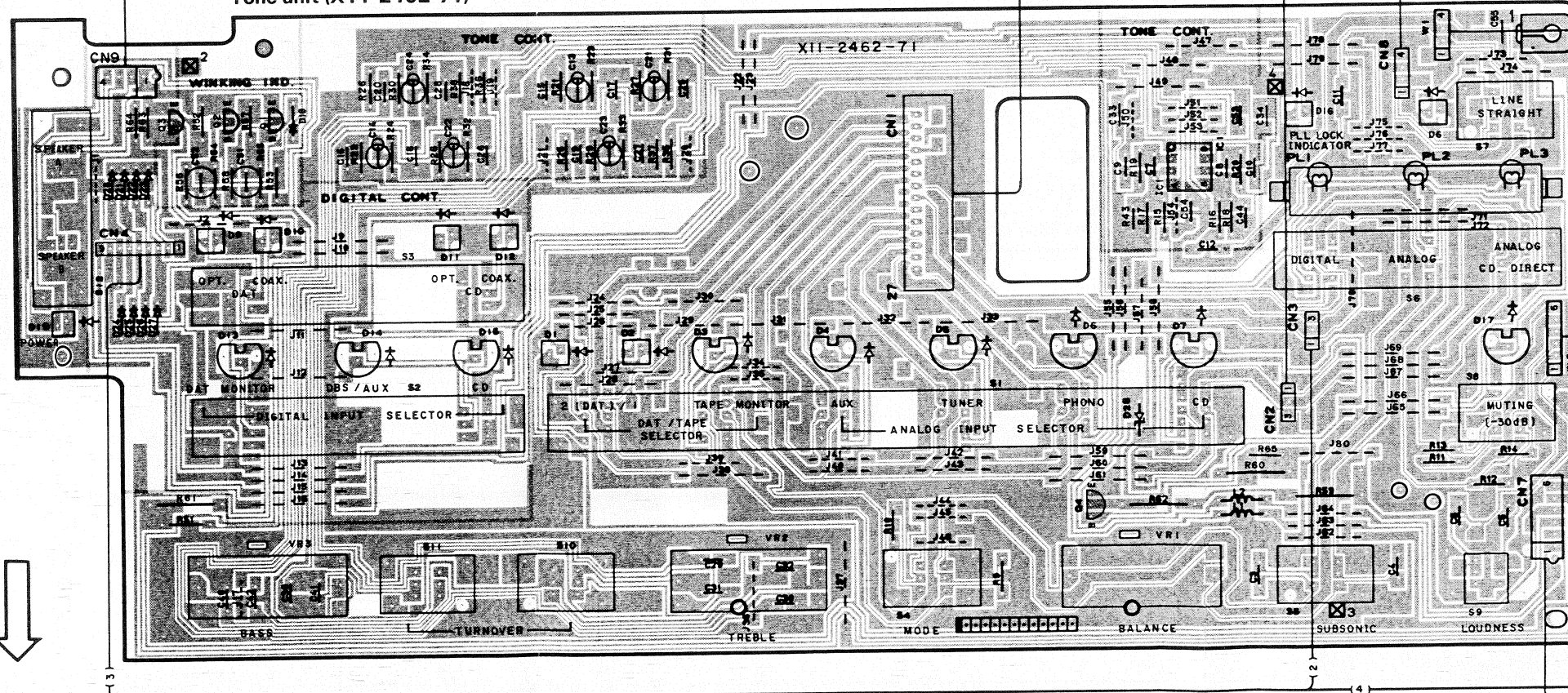
Pre-amplifier unit (X08-2222-71)  
SPEAKERS (A, B: 4~16Ω, A+B: 8~16Ω)



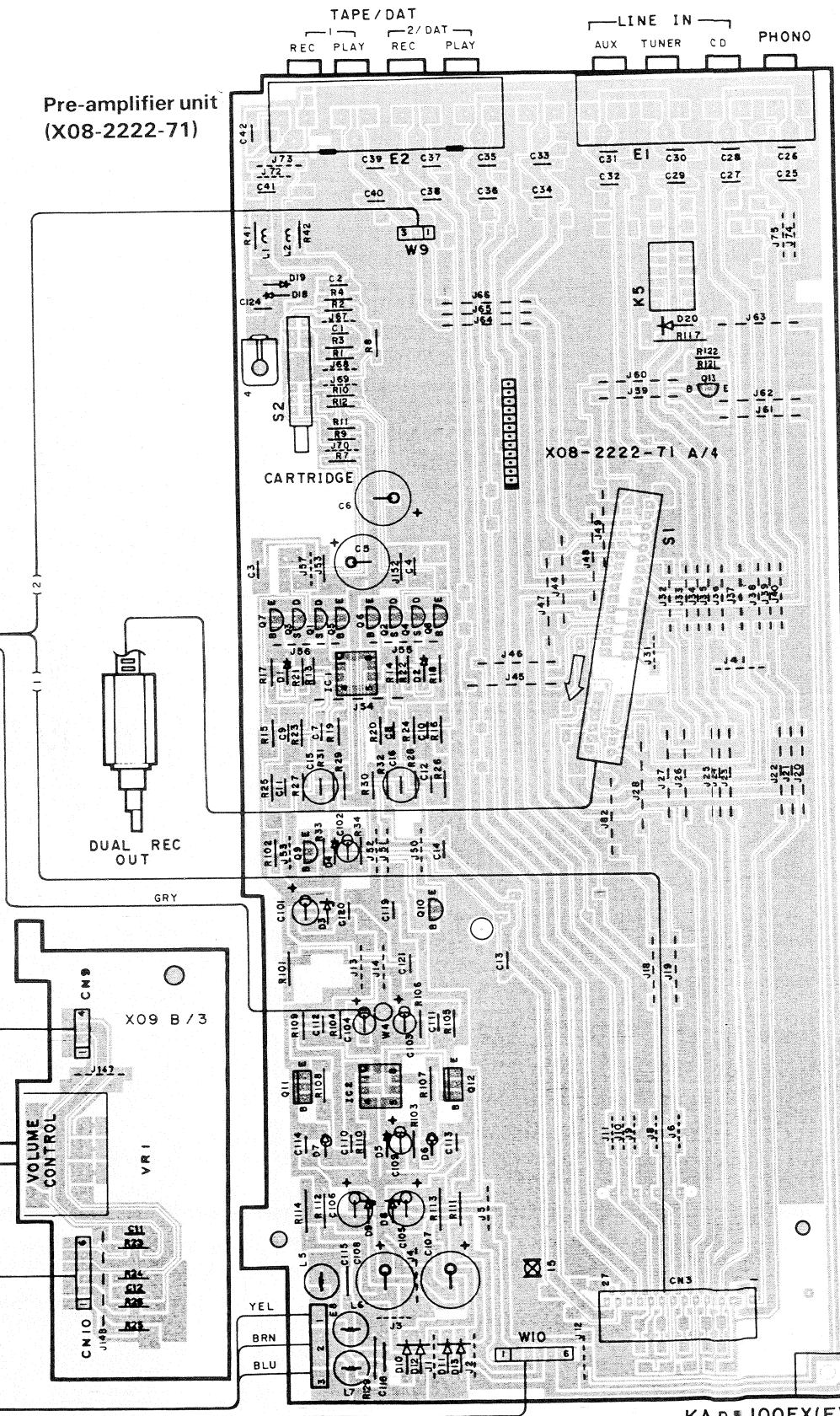
Power amplifier unit (X07-2392-71)



Tone unit (X11-2462-71)



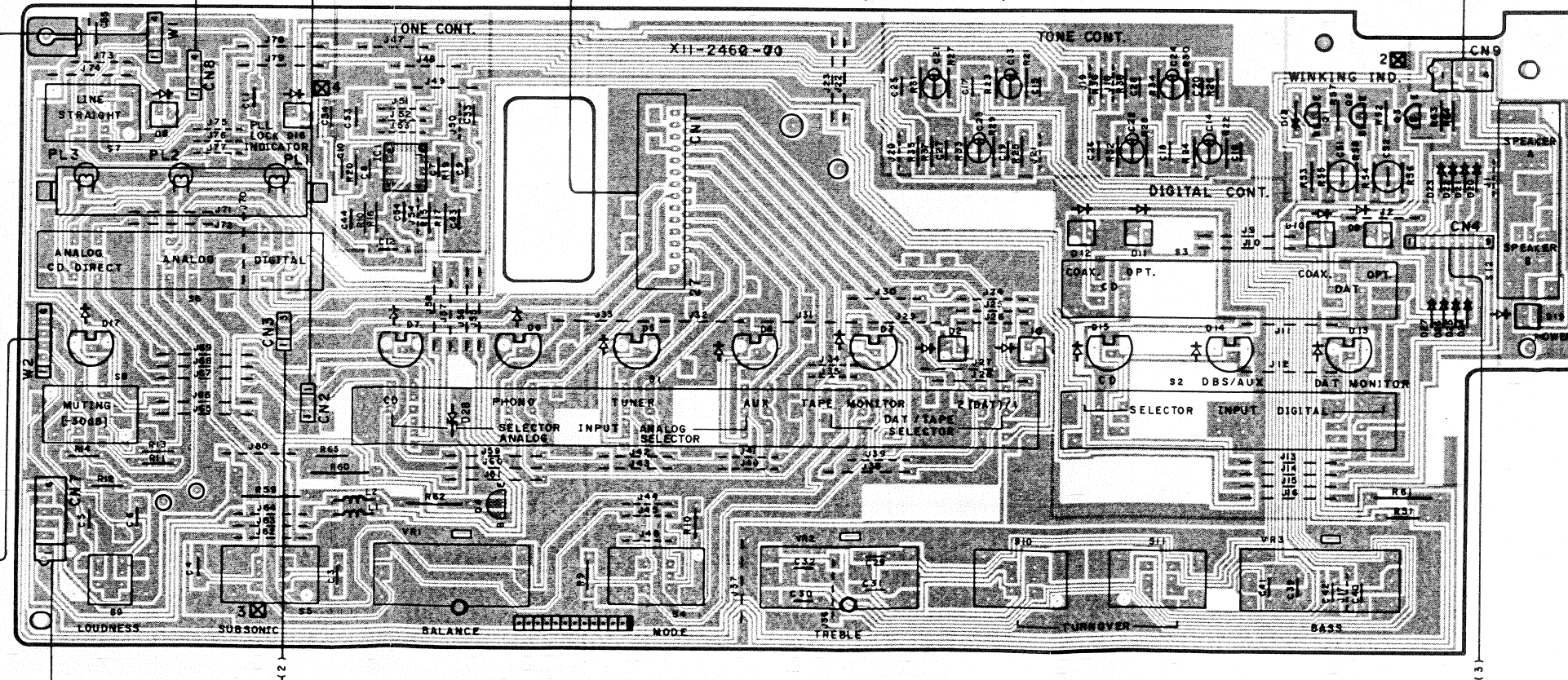
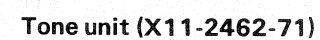
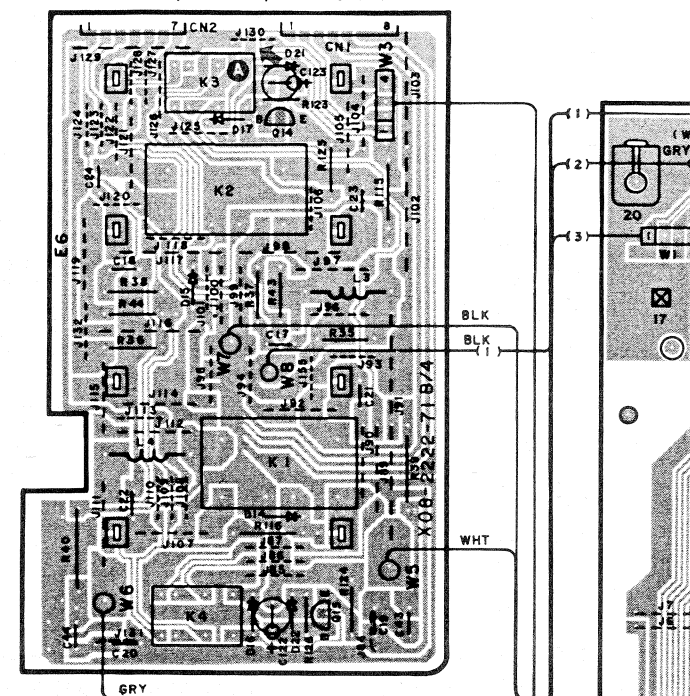
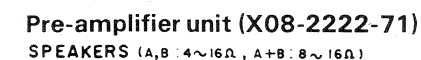
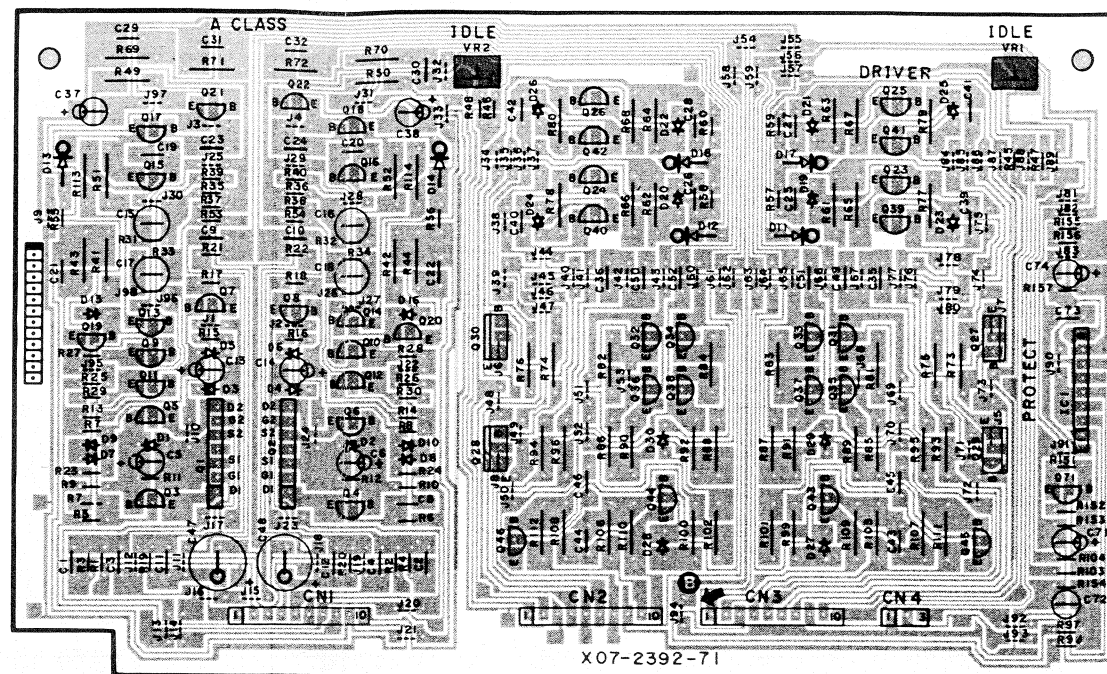
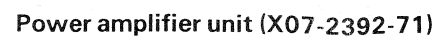
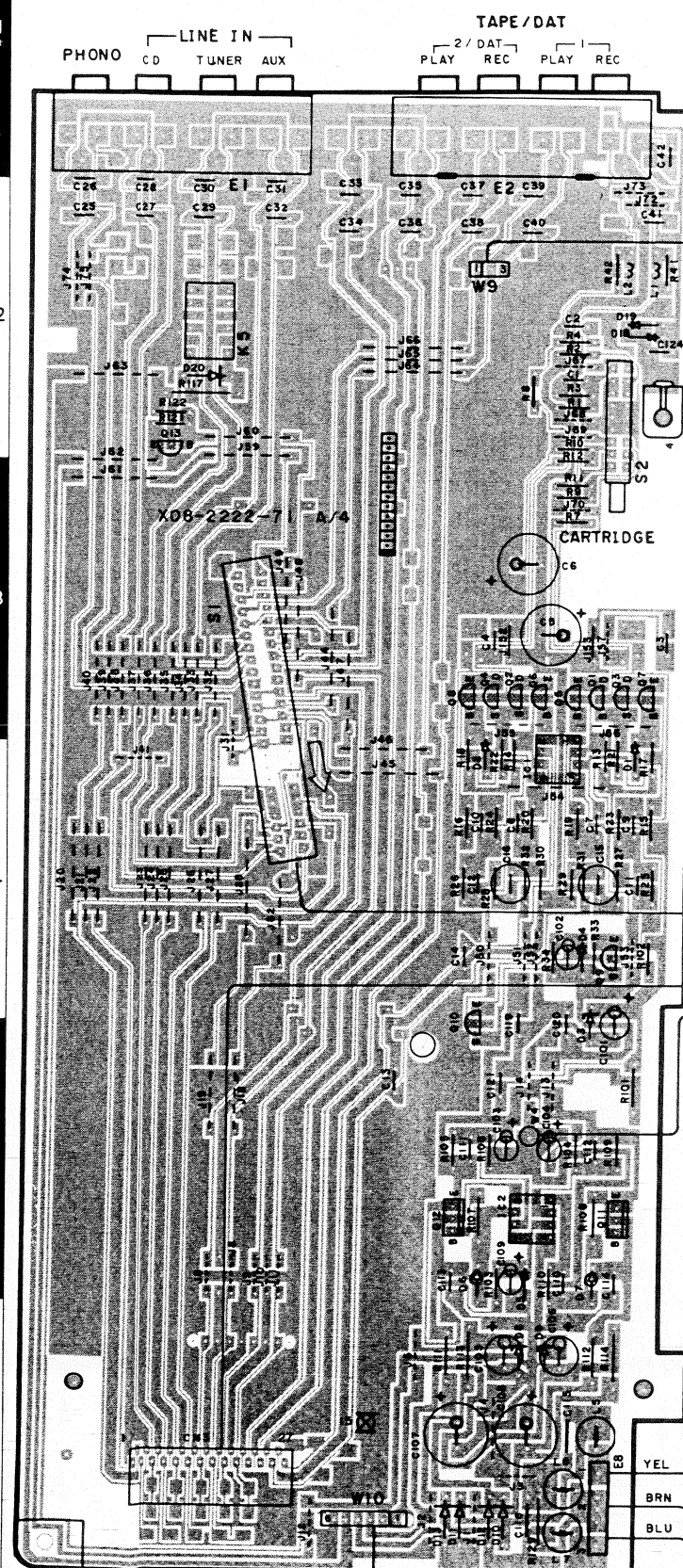
Pre-amplifier unit (X08-2222-71)



Refer to the schematic diagram for the values of resistors and capacitors.

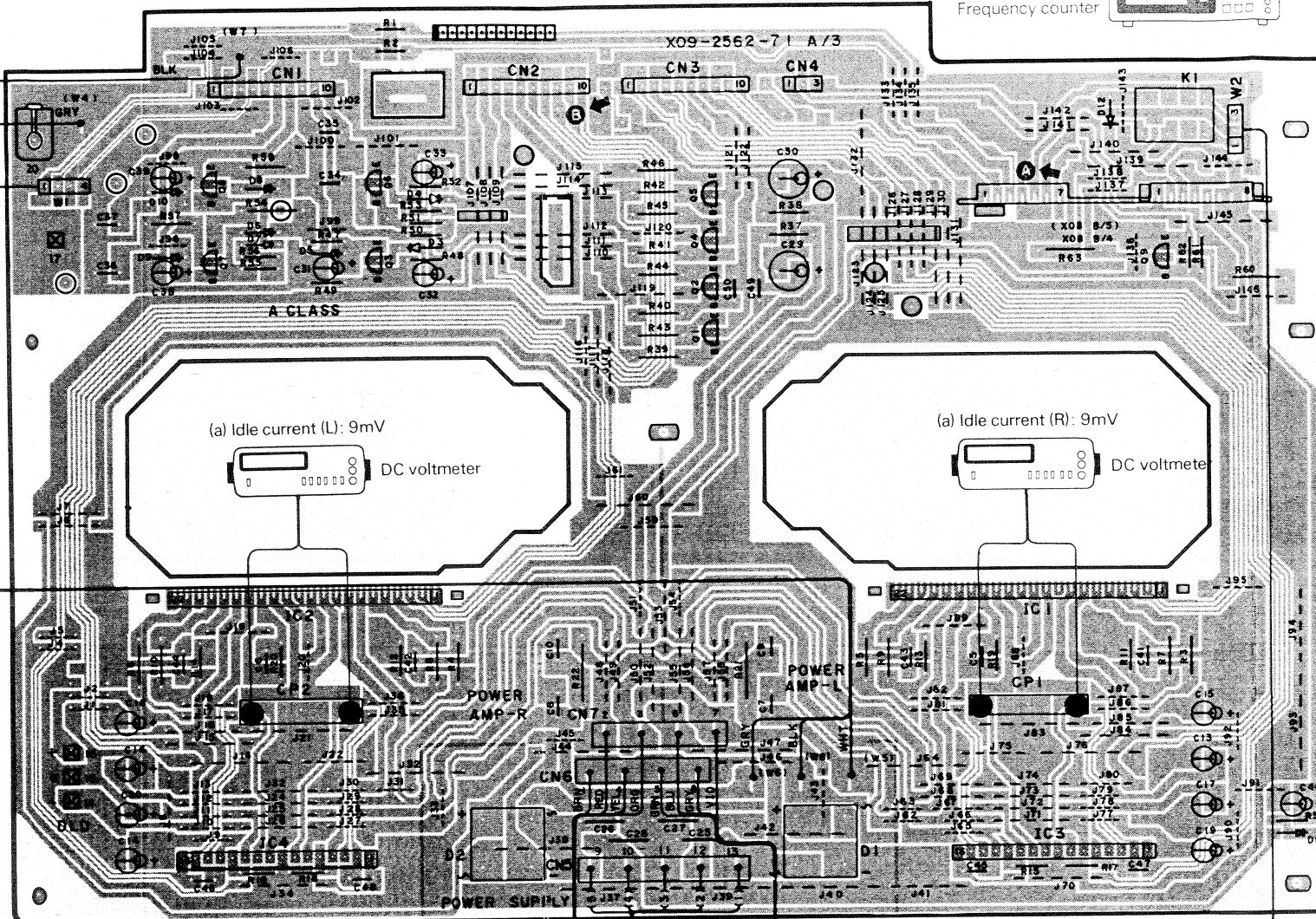
KA-D 100EX(E)





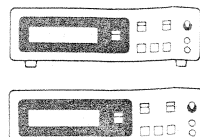


Audio unit (X09-2562-71)



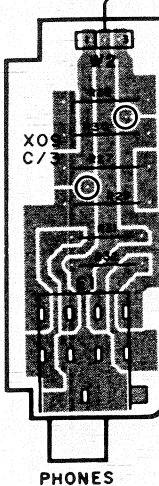
(c) VCXO (2)  
Frequency counter

(b) VCXO (1)  
Frequency counter



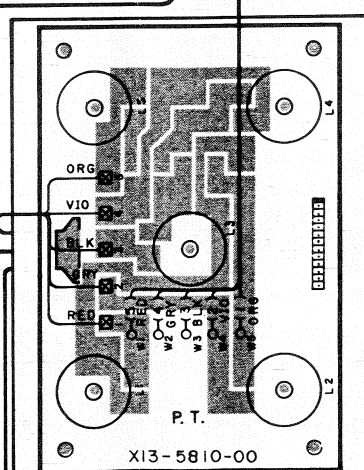
(a) Idle current (L): 9mV  
DC voltmeter

(a) Idle current (R): 9mV  
DC voltmeter

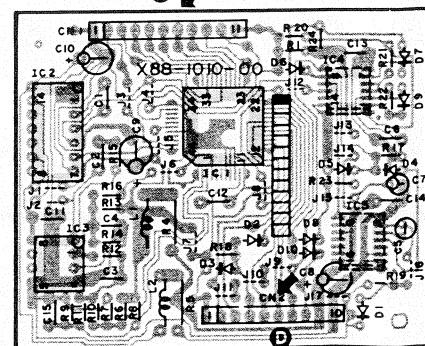


LOW  
RED  
C1-1  
BRN  
YEL  
C1-2  
ORG

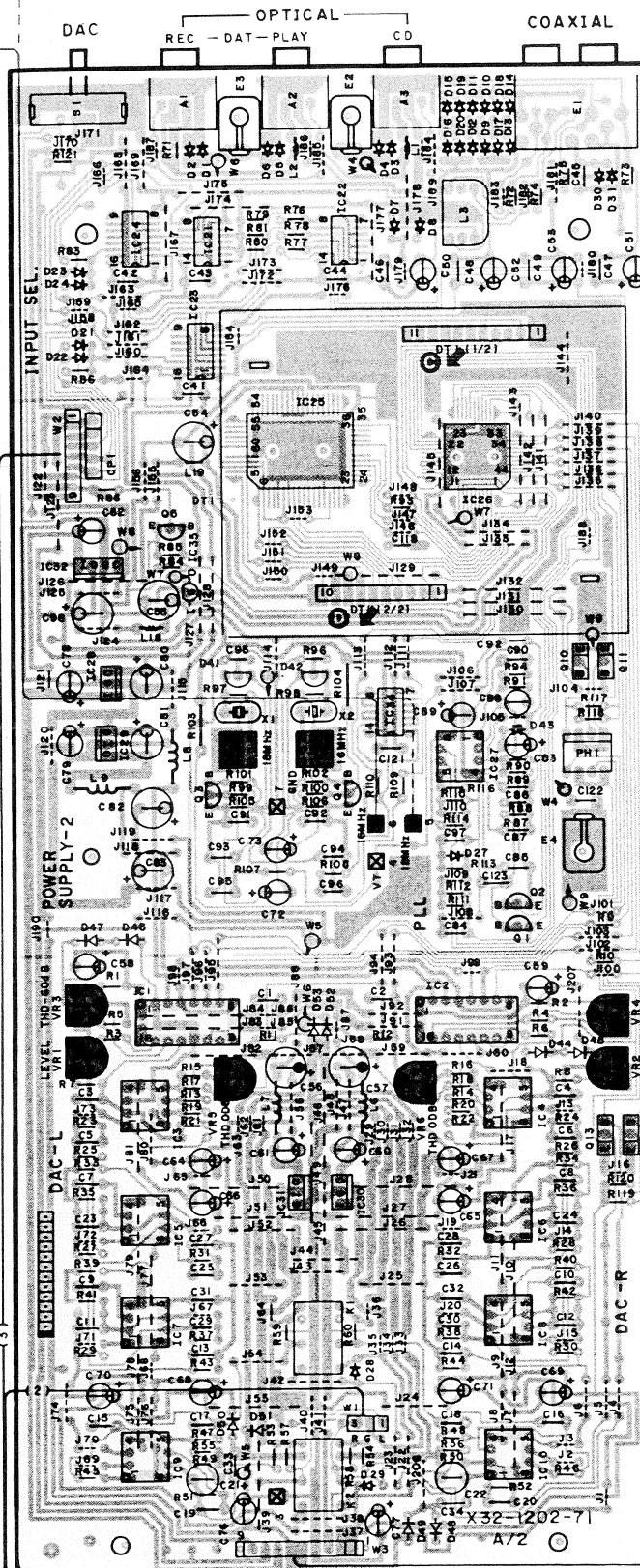
HIGH  
GRN  
C2-1  
BLU  
VIO  
C2-2  
GRY



Sub-circuit unit (X13-5810-00)



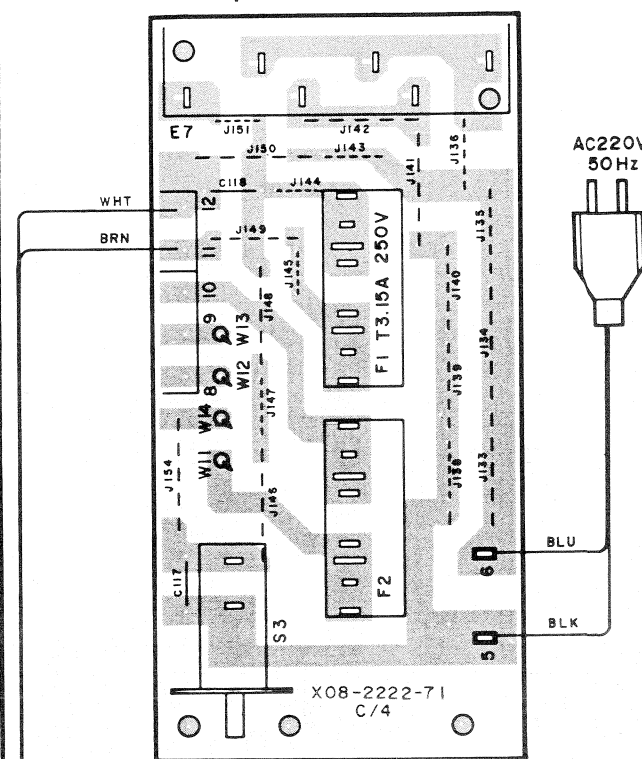
Digital I/O unit (X88-1010-00)



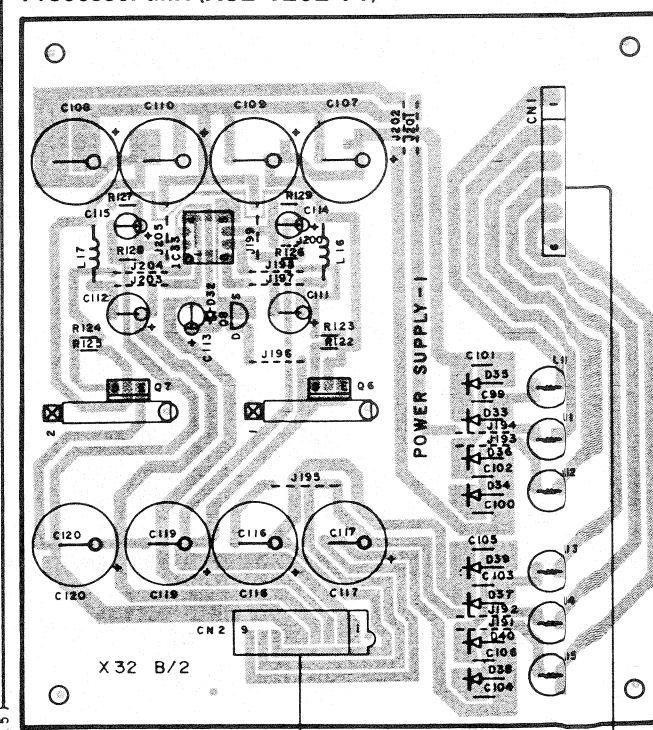
Processor unit (X32-1202-71)

PC BOARD (Foil Side View)

Pre-amplifier unit (X08-2222-71)

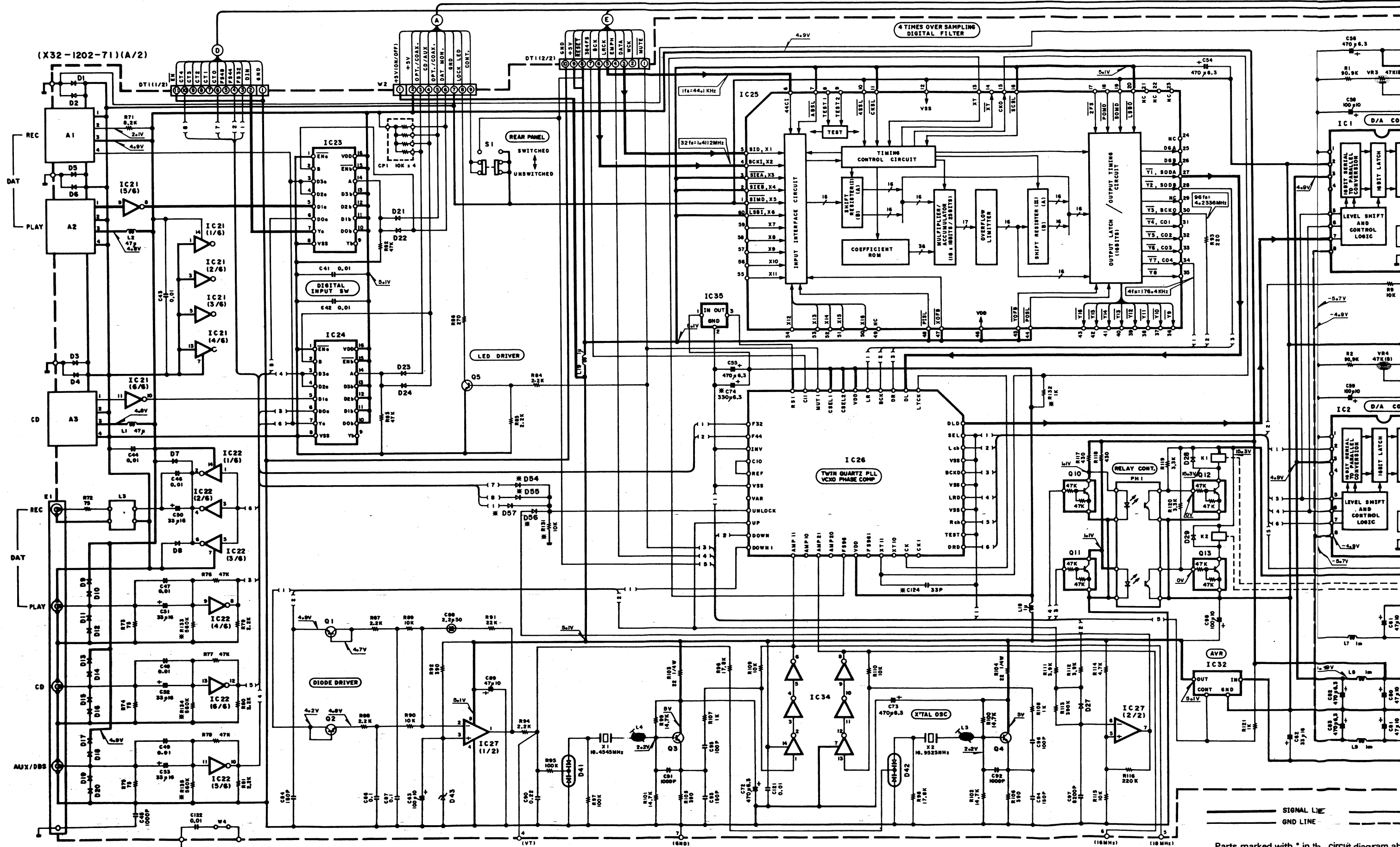


Processor unit (X32-1202-71)

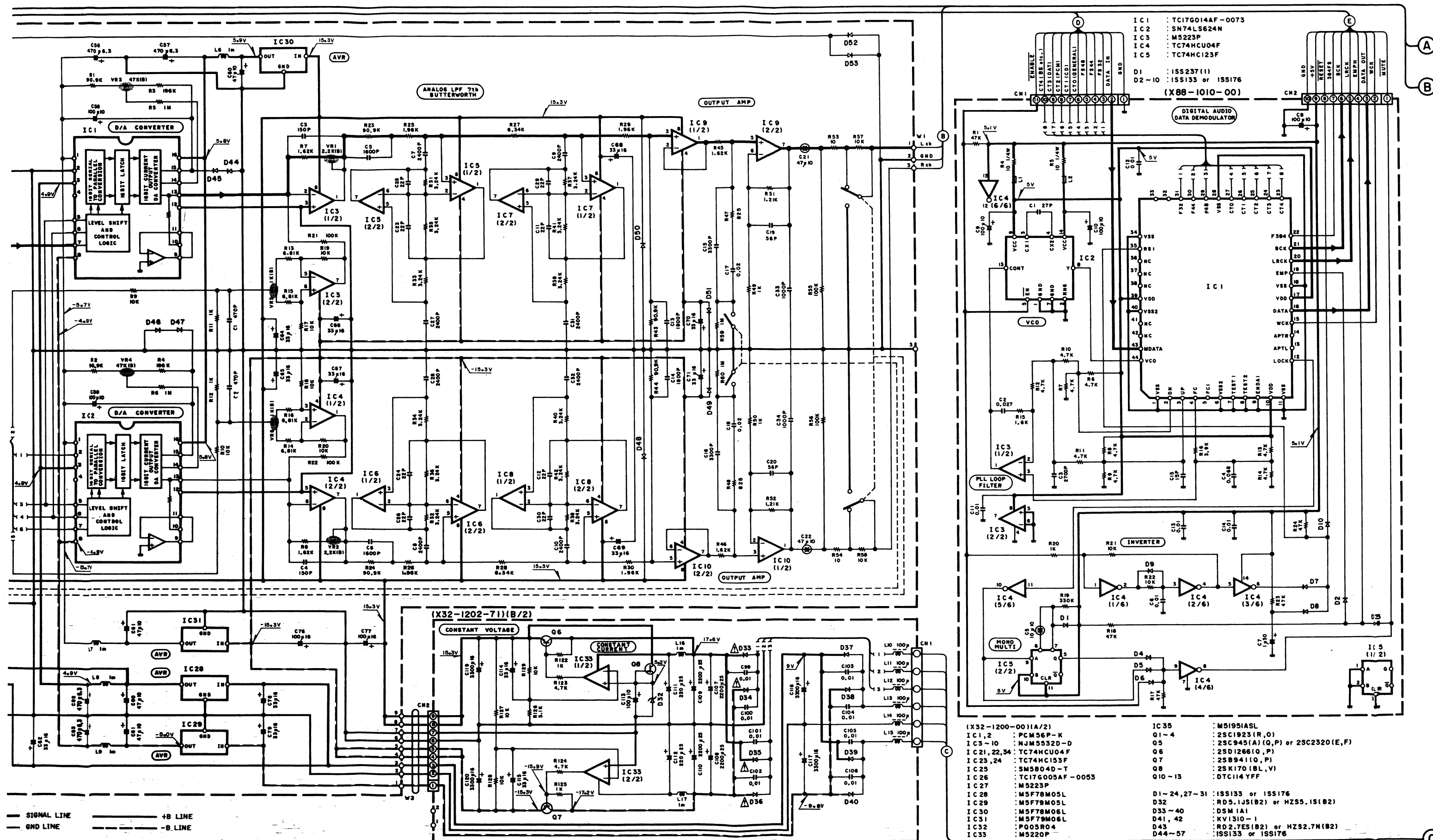


KA-D1100EX(E)





Parts marked with \* in the circuit diagram at C74, C124 and R131 to R135 are attached to PC board of only the unit produced in the period from 1987 to January 1988, therefore not shown in the diagram. Except for C74, the above parts are expected from the units produced from February 1988.



ed with \* in the circuit diagram above (D54 to D57, and R131 to R135) are attached to the back side of f only the units produced in the period from October uary 1988, therefore not shown in the PC board dia- pt for C74, these parts are expected to be eliminat- units produced from February 1988 and on.

**CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list).  $\Delta$  indicates safety critical components. To reduce the risk of electric shock, leakage current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

• DC voltages are measured with a high impedance voltme- ter. Values may vary slightly due to variations between in- dividual instruments or/and units.

• Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance. Les valeurs peuvent différer légère- ment du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

• Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Voltmeter gemessen. Dabei schwan- ken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u. U. geringfügig.

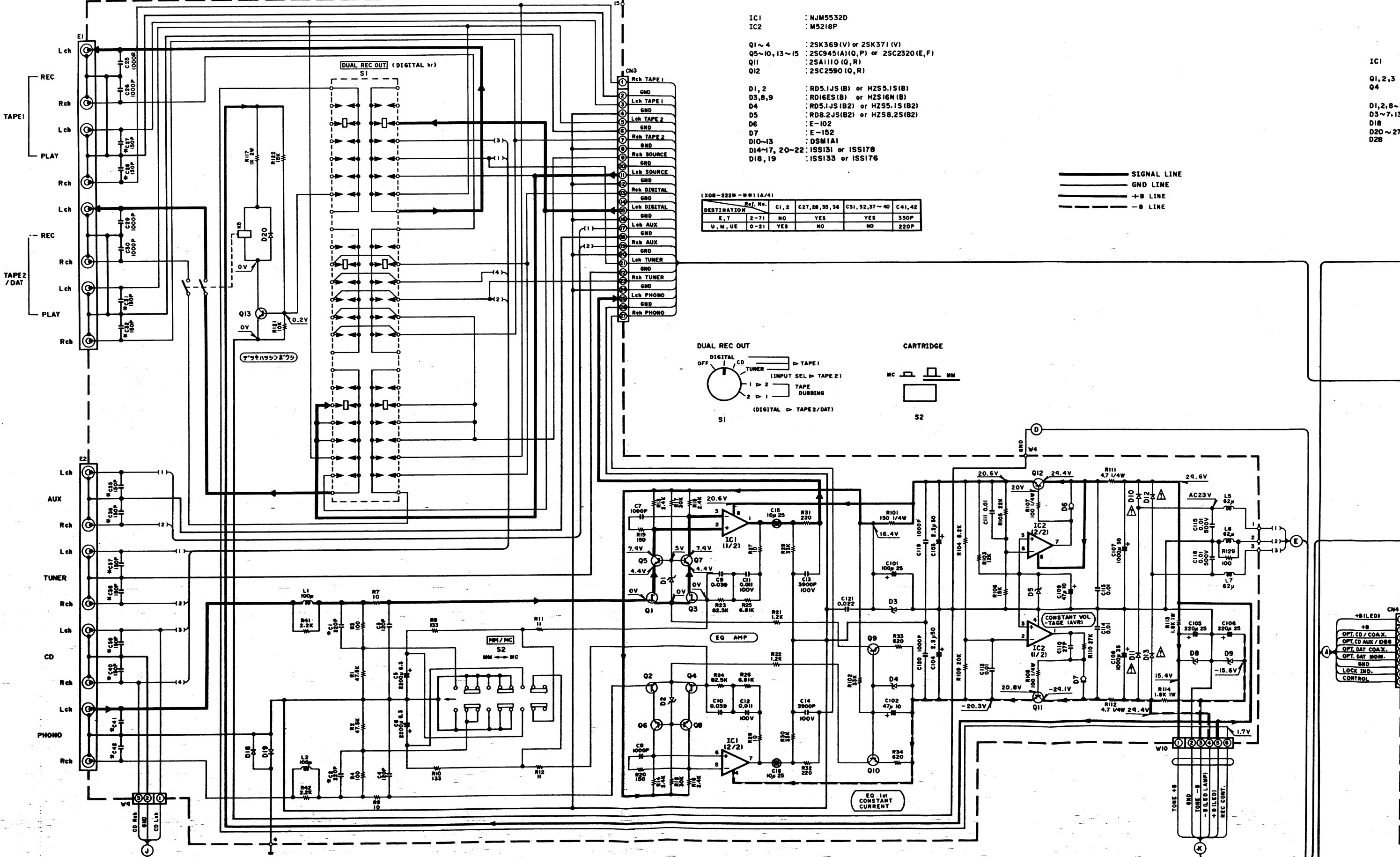
KA-D1100EX(1/3)

**KA-D1100EX**

**KENWOOD**

(A)  
(B)  
(C)

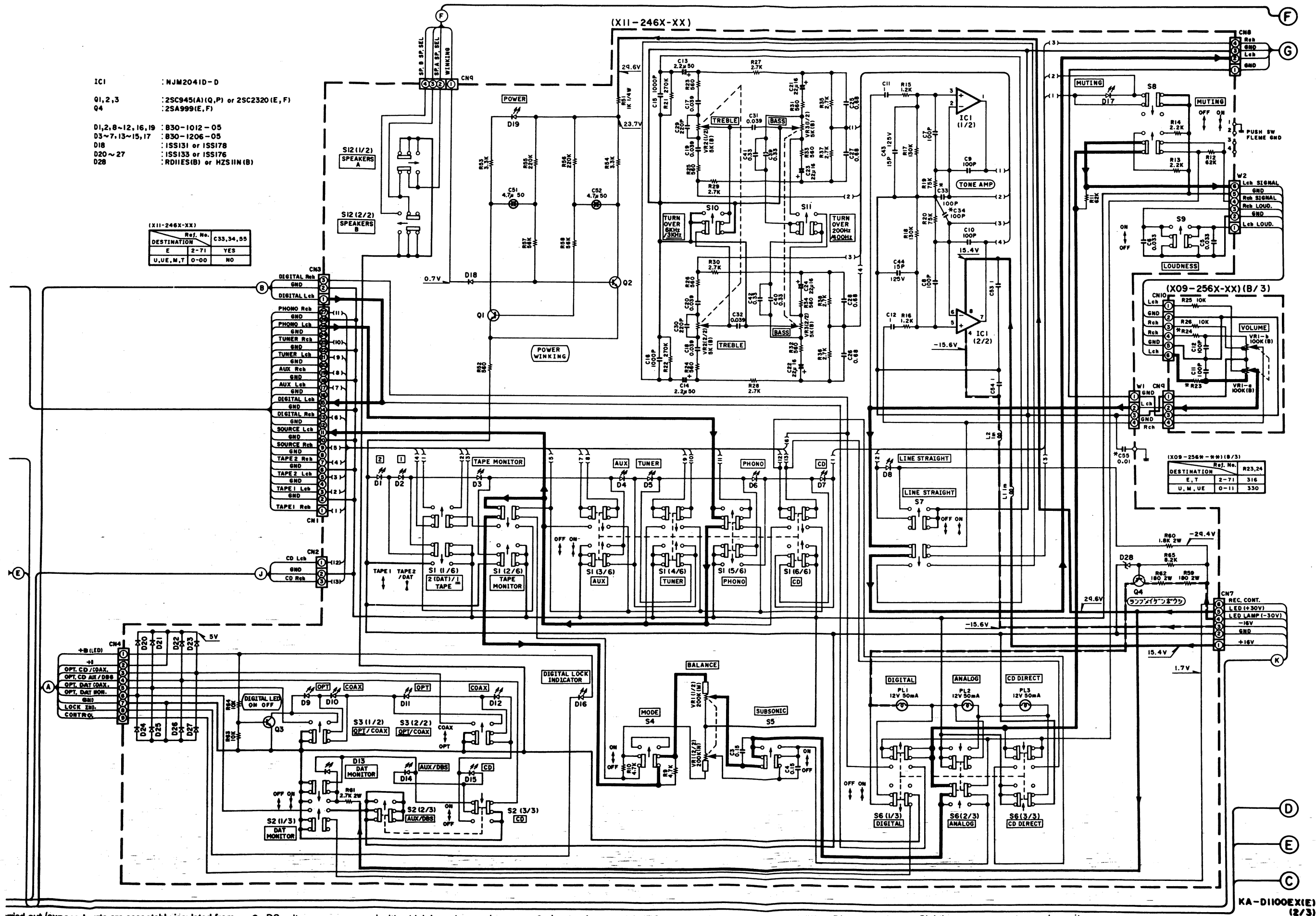
(X08-222X-XX) (A/4)



IC1 : NJM2041D-D  
Q1, 2, 3 : 2SC945(A)(Q,P) or 2SC2320 (E, F)  
Q4 : 2SA999(E, F)

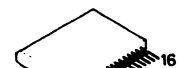
D1, 2, 6~12, 16, 19 : 830-1012-05  
D3~7, 13~15, 17 : 830-1206-05  
D18 : ISS131 or ISS178  
D20~27 : ISS133 or ISS176  
D28 : RD11ES(B) or HZS11N(B)

Ref. No.	C33, 34, 55
DESTINATION	2-71 YES
U, V, E, M, T	0-00 NO

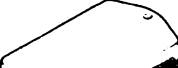


2SA1123  
2SA1124  
2SA1534A  
2SA733(A)  
2SA954  
2SA992  
2SA999  
2SC1845  
2SC1923  
2SC2003  
2SC2320  
2SC2631  
2SC2632  
2SC3940A  
2SC945(A)

TA2030



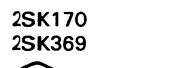
KAB02



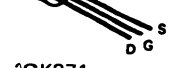
TC74HC123F  
TC74HC153F



M51951ASL



2SK170



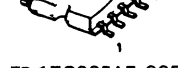
2SK369



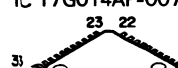
2SK371



TC74HCU04F



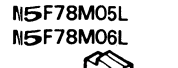
TC17G005AF-0053



SV15804D-T



NSF78M05L



NSF78M06L



M5218P



M5220P



M5223P



UPC1237HA



NSF79M05L



NSF79M06L

ried out (exposed parts are acceptably insulated from circuit) before the appliance is returned to the custom-

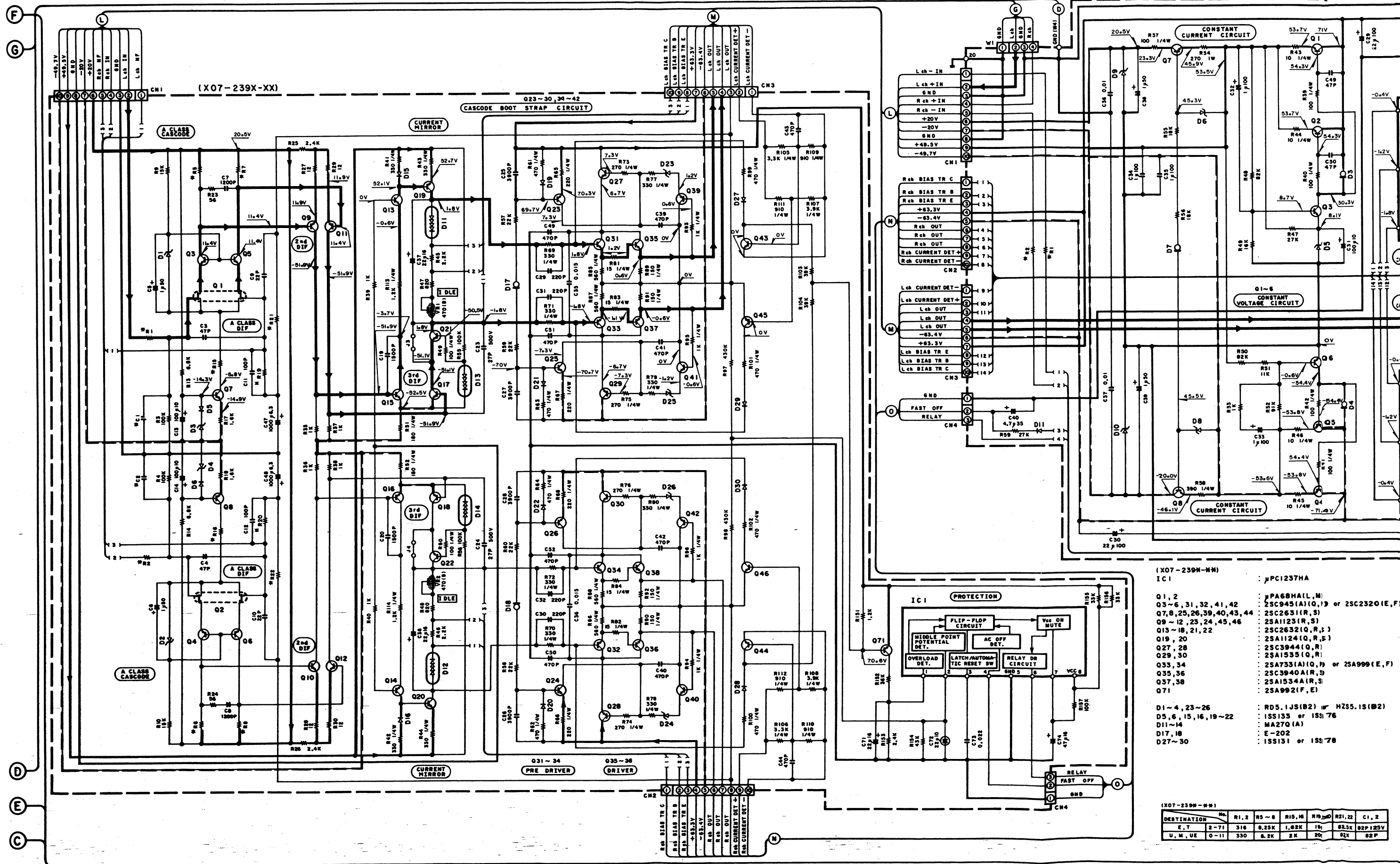
• DC voltages are measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

• Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

• Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Voltmeter gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u. U. geringfügig.

KA-D1100EX(E)  
(2/3)

(X09-256X-XX) (A/3)





AY

AZ

BA

BB

BC

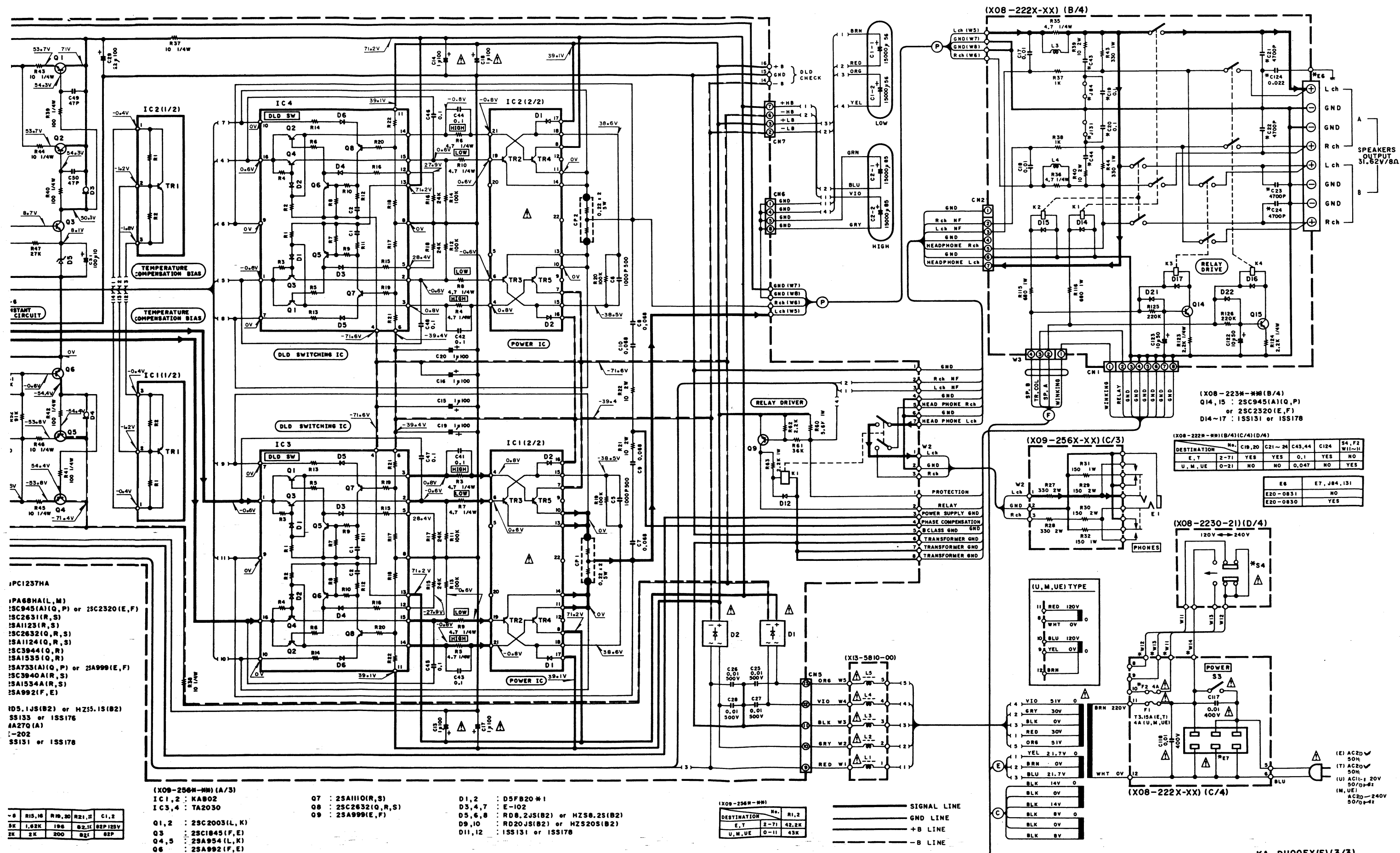
BD

BE

BF

BG

BH



KA-D1100EX(E) (3/3)

**CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list).  $\Delta$  Indicates safety critical components. To reduce the risk of electric shock, leakage current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

• DC voltages are measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

• Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

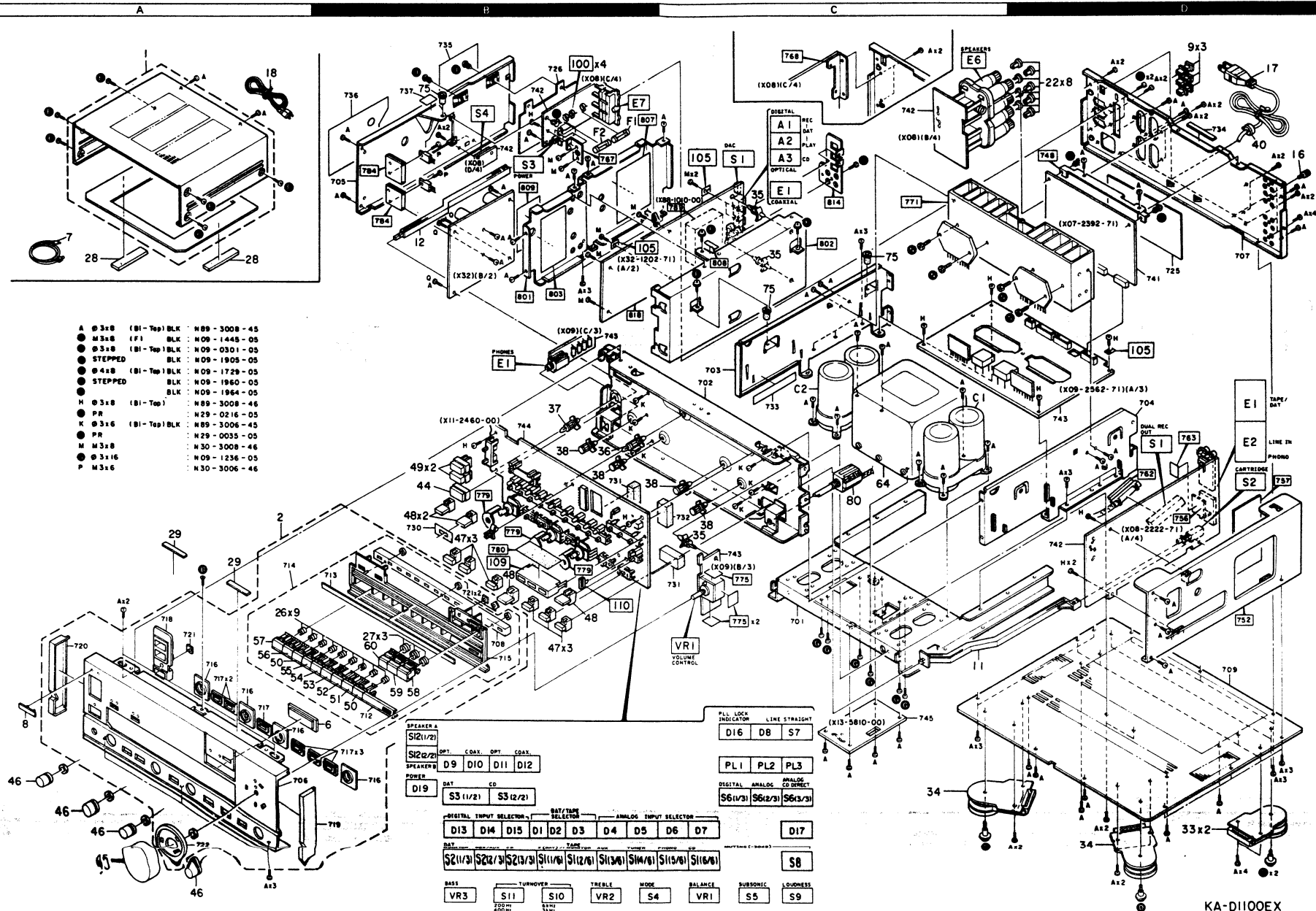
• Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Voltmeter gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u. U. geringfügig.

KA-D1100EX

KENWOOD

# KA-D1100EX KA-D1100EX

## EXPLODED VIEW



## PARTS LIST

\* New Parts

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Les articles non mentionnés dans le Parts No. ne sont pas fournis.

Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新部品	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
<b>KAD-1100EX</b>						
1	1A		A01-1605-01	METALLIC CABINET	TE	
1	1A	*	A01-1621-01	METALLIC CABINET	UMUE	
2	2A	*	A20-5376-02	PANEL ASSY		
6	3B		B10-0909-04	FRONT GLASS		
7	1A		B19-0531-05	OPTICAL FIBER ASSY	UMUETE	
8	3A		B43-0278-04	KENWOOD BADGE		
9	1D		B09-0063-05	CAP		
-			B46-0094-03	WARRANTY CARD	UUE	
-			B46-0095-03	WARRANTY CARD	UUE	
-			B46-0122-13	WARRANTY CARD	E	
-			B46-0143-03	WARRANTY CARD	T	
-		*	B50-8653-00	INSTRUCTION MANUAL (ENGLISH)		
-		*	B50-8654-00	INSTRUCTION MANUAL (FRENCH)	ME	
-		*	B50-8655-00	INSTRUCTION MANUAL (SPANISH)	M	
-		*	B50-8657-00	INSTRUCTION MANUAL (G.D.I.)	E	
-			B58-0223-04	CAUTION CARD (PRE-SET 120V)	U	
-			B58-0513-04	CAUTION CARD (PRESET 220-240)	UE	
-			B58-0803-13	CAUTION CARD	E	
-			B58-0862-00	CAUTION CARD	E	
-			B59-0092-00	SERVICE DIRECTORY	UUE	
C1	2C	*	C90-1595-05	ELECTR0 15000UFX256WV		
C2	2C	*	C90-1596-05	ELECTR0 15000UFX285WV		
11	3C		D21-1415-03	EXTENSION SHAFT (CARTRIDGE)		
12	1B		D21-1416-03	EXTENSION SHAFT (POWER SW)		
16	1D		E21-0006-25	BINDING POST		
17	1D		E30-0459-05	AC POWER CORD	E	
17	1D		E30-0812-05	AC POWER CORD	UMUE	
17	1D		E30-1416-05	AC POWER CORD	T	
18	1A	*	E30-2350-05	AUDIO CORD		
22	1D	*	F19-0562-05	HOLE CAP	E	
F1	1B		F05-3121-05	FUSE (SEMKE) (250V T3.15A)	TE	
F1	1B		F05-4022-05	FUSE (250V 4A)	UMUE	
26	2A		G01-2138-04	COMPRESSION SPRING (DAT)		
27	3B		G01-2139-04	COMPRESSION SPRING (DIGITAL)		
28	1A		G11-0153-04	SOFT TAPE (80X12X3) CASE		
29	2A		G11-0155-14	SOFT TAPE (40X9X2) PANEL		
-		*	H01-7723-04	ITEM CARTON CASE		
-			H10-3519-12	POLYSTYRENE FOAMED FIXTURE		
-			H10-3520-02	POLYSTYRENE FOAMED FIXTURE		
-			H25-0232-04	PROTECTION BAG (235X350X0.03)		
-			H25-0274-04	PROTECTION BAG (900X500X0.05)		
33	3D		J02-0358-05	INSULATOR ASSY (4KG)		
34	3C, 3D		J02-0360-05	INSULATOR ASSY (6KG)		
35	1C, 2C		J19-0506-05	UNIT HOLDER (H=8.3)		
36	2B		J19-0514-05	UNIT HOLDER (H=11.3)		
37	2B		J19-0515-05	UNIT HOLDER (H=8.3)		
38	2B, 2C		J19-2536-05	UNIT HOLDER		
40	1D		J42-0083-05	POWER CORD BUSHING		

E: Scandinavia & Europe K: USA P: Canada  
 U: Far East, Hawaii T: England M: Other Areas  
 UE: AAFES (Europe) X: Australia

△ indicates safety critical components.

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Ref. No. 参照番号	Address 位置	New Parts 新部品	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
44	2B		K29-2432-03	KN08 ASSY (BUTTON) POWER		
45	3A		K29-2837-04	KN08 (VOLUME CONTROL)		
46	3A		K29-2838-04	KN08 (BASS, TREB, BAL, REC, QUT)		
47	2B, 3B		K29-2843-04	KN08 ASSY (BUTTON) TURNOVER, M0		
48	2B		K29-2845-04	KN08 ASSY (BUTTON) DAT, CD, MUTE		
49	2B		K29-2847-04	KN08 ASSY (BUTTON) SPEAKER		
50	3A, 3B		K29-2849-04	KN08 ASSY (BUTTON) CD		
51	3B		K29-2850-04	KN08 ASSY (BUTTON) PHONE		
52	3B		K29-2851-04	KN08 ASSY (BUTTON) TUNER		
53	3A		K29-2852-04	KN08 ASSY (BUTTON) AUX		
54	3A		K29-2853-04	KN08 ASSY (BUTTON) TAPE MONI		
55	3A		K29-2854-04	KN08 ASSY (BUTTON) 2(DAT)/1		
56	3A		K29-2855-04	KN08 ASSY (BUTTON) DBS/AUX		
57	3A		K29-2856-04	KN08 ASSY (BUTTON) DAT MONITOR		
58	3B		K29-2862-04	KN08 ASSY (BUTTON) ANALG, CD DIR		
59	3B		K29-2863-04	KN08 ASSY (BUTTON) ANALOG		
60	3B		K29-2864-04	KN08 ASSY (BUTTON) DIGITAL		
64	2C	*	L01-4872-05	POWER TRANSFORMER	E	
64	2C	*	L01-4875-05	POWER TRANSFORMER	UMUE	
64	2C	*	L01-4877-05	POWER TRANSFORMER	T	
-			L92-0019-05	FERRITE CORE		
75	1C		N14-0179-05	BUILD-IN NUT		
B	2A		N09-1445-05	SET SCREW (M3X8) PANEL		
C	1C, 1D		N09-0301-05	TAPTITE SCREW (03X8) X32	UMUETE	
D	3C, 3D		N09-1905-05	STEPPED SCREW F80T		
E	1A		N09-1729-05	TAPTITE SCREW (04X8) CASE		
F	1C	*	N09-1960-05	STEPPED SCREW X32		
G	3C	*	N09-1964-05	MACHINE SCREW TRANS		
J	1B		N29-0216-05	RIVET		
80	2C		S90-0106-05	REMOTE SWITCH SHAFT		
<b>POWER AMPLIFIER UNIT (X07-2392-71)</b>						
C1	2		CC45FSL1H020J	CERAMIC 82PF	J	UMUE
C1	2		C91-0177-05	POLYSTY 82PF	K	TE
C3	4		CC45FSL1H470J	CERAMIC 47PF	J	UMUE
C3	4	*	C91-0979-05	CERAMIC 47PF	G	TE
C5	6		CE04KW1H010MEL	ELECTR0 1.0UF	50WV	
C7	8		CF92FV1H122J	MF 1200PF	J	
C9	10		CC45FSL1H220J	CERAMIC 22PF	J	UMUE
C9	10	*	C91-0978-05	CERAMIC 22PF	G	TE
C11	12		CC45FSL1H101J	CERAMIC 100PF	J	UMUE
C11	12		CG09FS1H101JZS	POLYSTY 100PF	J	TE
C13	14		CE04KW1A101MEL	ELECTR0 100UF	10WV	
C19	20		CK45FB1H152K	CERAMIC 1500PF	K	
C23	24		CC45FSL2H270J	CERAMIC 27PF	J	
C25	28		CF92FV1H392J	MF 3900PF	J	
C29			CC45FSL1H221J	CERAMIC 220PF	J	
C30			CC45FSL1H221J	CERAMIC 220PF	J	
C31	32		CC45FSL1H221J	CERAMIC 220PF	J	
C35	36		CF92FV1H153J	MF 0.015UF	J	
C37	38		CE04KW1C220MEL	ELECTR0 22UF	16WV	
C39	44		CK45FB1H471K	CERAMIC 470PF	K	
C47	48		CE04KW0J102MEL	ELECTR0 1000UF	6.3WV	
C49	52		CK45FB1H471K	CERAMIC 470PF	K	

E: Scandinavia & Europe K: USA P: Canada  
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 UE: AAFES (Europe) X: Australia

△ indicates safety critical components.



# KA-D1100EX KA-D1100EX

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Ref. No. 参照番号	Address 位置	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
C71 C72 C73 C74		CE04KW1C220MEL C90-1333-05 CF92FV1H223J CE04KW1C470MEL	ELECTR0 22UF 16WV NP-ELEC 22UF 10WV MF 0.022UF J ELECTR0 47UF 16WV		
L	1D	N29-0035-05	PUSH RIVET (3.5X5.5)		
R1 ,2 R3 ,4 R5 -8 R15 ,16 R19 ,20		RN14BK2C3160FTS RN14BK2C1003FTS RN14BK2C8251FTS RN14BK2C1621FTS RN14BK2C1960FTS	RN 316.0 F 1/6W RN 100K F 1/6W RN 8.25K F 1/6W RN 1.62K F 1/6W RN 196.0 F 1/6W	TE TE TE TE TE	
R21 ,22 R41 -44 R49 ,50 R51 ,52 R61 -64		RN14BK2C8252FTS RD14AB2E331JTS RD14AB2E101JTS RD14AB2E181JTS RD14AB2E471JTS	RN 82.5K F 1/6W FL-PR00F RD 330 J 1/4W FL-PR00F RD 100 J 1/4W FL-PR00F RD 180 J 1/4W FL-PR00F RD 470 J 1/4W	TE	
R65 -68 R69 -72 R73 -76 R77 -80 R81 -84		RD14AB2E221JTS RD14AB2E331JTS RD14AB2E271JTS RD14AB2E331JTS RD14AB2E150JTS	FL-PR00F RD 220 J 1/4W FL-PR00F RD 330 J 1/4W FL-PR00F RD 270 J 1/4W FL-PR00F RD 330 J 1/4W FL-PR00F RD 15 J 1/4W		
R85 -88 R89 -92 R93 -96 R99 -102 R105,106		RD14AB2E561JTS RD14AB2E151JTS RD14AB2E102JTS RD14AB2E471JTS RD14AB2E332JTS	FL-PR00F RD 560 J 1/4W FL-PR00F RD 150 J 1/4W FL-PR00F RD 1.0K J 1/4W FL-PR00F RD 470 J 1/4W FL-PR00F RD 3.3K J 1/4W		
R107,108 R109-112 R113,114 VR1 ,2		RD14AB2E392JTS RD14AB2E911JTS RD14AB2E122JTS R12-0109-05	FL-PR00F RD 3.9K J 1/4W FL-PR00F RD 910 J 1/4W FL-PR00F RD 1.2K J 1/4W TRIMMING P0T. (470B) IDLE		
D1 -4 D1 -4 D5 ,6 D5 ,6 D11 -14		HZS5.1S(B2) RDS.1JS(B2) 1SS133 1SS176 MA270(A)	ZENER DIODE ZENER DIODE DIODE DIODE VARISTOR		
D15 ,16 D15 ,16 D17 ,18 D19 -22 D19 -22		1SS133 1SS176 E-202 1SS133 1SS176	DIODE DIODE CONSTANT CURRENT DIODE DIODE DIODE		
D23 -26 D23 -26 D27 -30 D27 -30 IC1		HZS5.1S(B2) RDS.1JS(B2) 1SS131 1SS178 UPC1237HA	ZENER DIODE ZENER DIODE DIODE DIODE IC (POWER AMP)		
Q1 ,2 Q3 -6 Q3 -6 Q7 ,8 Q9 -12		UPA68HA(L,M) 2SC2320(E,F) 2SC945(A)(Q,P) 2SC2631(R,S) 2SA1123(R,S)	IC TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q13 ,18 Q19 ,20 Q21 ,22 Q23 ,24 Q25 ,26		2SC2632(O,R,S) 2SA1124(O,R,S) 2SC2632(O,R,S) 2SA1123(R,S) 2SC2631(R,S)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		

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Q27 ,28 Q29 ,30 Q31 ,32 Q31 ,32 Q33 ,34		2SC3944A(O,R) 2SA1535A(O,R) 2SC2320(E,F) 2SC945(A)(Q,P) 2SA733(A)(Q,P)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q33 ,34 Q35 ,36 Q37 ,38 Q39 ,40 Q41 -44		2SA999(E,F) 2SC3940A(R,S) 2SA1534A(R,S) 2SA1123(R,S) 2SC2631(R,S)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q45 ,46 Q71		2SA1123(R,S) 2SA992(F,E)	TRANSISTOR TRANSISTOR		
PRE AMPLIFIER UNIT (X08-2222-71)					
C1 ,2 C3 ,4 C5 ,6 C7 ,8 C9 ,10		CF92FV1H221K CF92FV1H121K CE04KW0J222M CK45F81H102K C91-0790-05	MF 220PF K MF 120PF K ELECTR0 2200UF 6.3WV CERAMIC 1000PF K FILM 0.039UF J		
C11 ,12 C13 ,14 C15 ,16 C17 ,18 C19 ,20		CQ93HP2A113G CQ93HP2A392J C90-1332-05 CF92FV1H103J CF92FV1H104J	MYLAR 0.011UF G MYLAR 3900PF J NP-ELEC 10UF 25WV MF 0.010UF J MF 0.10UF J	TE	
C21 -24 C25 -32 C35 -40 C41 ,42 C41 ,42		CF92FV1H472J CF92FV1H151K CF92FV1H151K CF92FV1H221K CF92FV1H331K	MF 4700PF J MF 150PF K MF 150PF K MF 220PF K MF 330PF K	TE TE TE UMUE TE	
C43 ,44 C43 ,44 C101 C102 C103,104		CF92FV1H104J CF92FV1H473J CE04KW1E101M CE04KW1A470M CE04KW1H2R2M	MF 0.10UF J MF 0.047UF J ELECTR0 100UF 25WV ELECTR0 47UF 10WV ELECTR0 2.2UF 50WV	TE UMUE	
C105,106 C107,108 C109 C110 C111-114		CE04KW1E221M CE04KW1V102M CE04KW1A470M CC45FSL1H270J CF92FV1H103J	ELECTR0 220UF 25WV ELECTR0 1000UF 35WV ELECTR0 47UF 10WV CERAMIC 27PF J MF 0.010UF J		
C115,116 C117,118 C119-121 C122,123 C124,125		CK45FE2H103P C91-0647-05 CF92FV1H103J CE04KW1H100M CF92FV1H105J	CERAMIC 0.010UF P CERAMIC 0.01UF P MF 0.010UF J ELECTR0 10UF 50WV MF 1.0UF J		
E2 E7 E1 E6 E6	2D 1B 2D 1C 1C	E13-0821-05 E03-0093-05 E13-0814-05 E20-0830-05 E20-0831-05	PHONE JACK (TUNER,PHONE) AC OUTLET PHONE JACK (8P)(TAPE/DAT) SCREW TERMINAL BOARD SCREW TERMINAL BOARD	UMUE UMUE TE	
100 100 -	1B 1B	J13-0041-05 J13-0054-05 J61-0033-05 J61-0307-05	FUSE CLIP (06) FUSE CLIP (05) WIRE BAND WIRE BAND	UMUE TE	
L1 ,2 L3 ,4		L40-1011-47 L39-0080-15	SMALL FIXED INDUCTOR(100UH,K) PHASE-COMPENSATION COIL		

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L5 -7			L33-0328-05	CHØKE COIL		
R1 .2			RN14BK2C4752FTS	RN 47.5K F 1/6W		
R3 .4			RN14BK2C1000FTS	RN 100.0 F 1/6W		
R7 .8			RN14BK2C10R0FTS	RN 10.0 F 1/6W		
R9 .10			RN14BK2C1330FTS	RN 133.0 F 1/6W		
R11 .12			RN14BK2C11R0FTS	RN 11.0 F 1/6W		
R23 .24			RN14BK2C8252FTS	RN 82.5K F 1/6W		
R25 .26			RN14BK2C6811FTS	RN 6.81K F 1/6W		
R27 .28			RN14BK2C10R0FTS	RN 10.0 F 1/6W		
R35 .36			RD14AB2E4R7JTS	FL-PR00F RD 4.7 J 1/4W		
R37 .38			RN14BK2C1001FTS	RN 1.00K F 1/6W		
R39 .40			RS14DB3D100JTE	FL-PR00F RS 10 J 2W		
R43		*	RS14KB3A331JTE	FL-PR00F RS 330 J 1W		
R44			RS14DB3A331JTE	FL-PR00F RS 330 J 1W		
R101			RD14AB2E151JTS	FL-PR00F RD 150 J 1/4W		
R107,108			RD14AB2E101JTS	FL-PR00F RD 100 J 1/4W		
R111			RD14AB2E4R7JTS	FL-PR00F RD 4.7 J 1/4W		
R112			RD14GB2E4R7JTS	FL-PR00F RD 4.7 J 1/4W		
R113,114			RS14DB3A182JTE	FL-PR00F RS 1.8K J 1W		
R115,116			RS14DB3A681JTE	FL-PR00F RS 680 J 1W		
R117			RS14DB3D102JTE	FL-PR00F RS 1.0K J 2W		
R123,124			RD14AB2E222JTS	FL-PR00F RD 2.2K J 1/4W		
K1 .2			SS1-2045-05	MAGNETIC RELAY		
K3 .4			SS1-2075-05	MAGNETIC RELAY		
K5			SS1-2074-05	MAGNETIC RELAY		
S1	2D		S90-0078-05	SLIDE SWITCH (DUAL REC OUT)		
S2	2D		S40-6027-05	PUSH SWITCH (CARTRIDGE)		
△ S3	1B		S40-1073-05	PUSH SWITCH (POWER)		
△ S4	1B		S31-2115-05	SLIDE SWITCH (240V-120V)	UMUE	
D1 .2			HZS5.1S(B)	ZENER DIODE		
D1 .2			RD5.1JS(B)	ZENER DIODE		
D3			HZS16N(B)	ZENER DIODE		
D3			RD16ES(B)	ZENER DIODE		
D4			HZS5.1S(B2)	ZENER DIODE		
D4			RD5.1JS(B2)	ZENER DIODE		
D5			HZS8.2S(B2)	ZENER DIODE		
D5			RD8.2JS(B2)	ZENER DIODE		
D6			E-102	CONSTANT CURRENT DIODE		
D7			E-152	CONSTANT CURRENT DIODE		
D8 .9			HZS16N(B)	ZENER DIODE		
D8 .9			RD16ES(B)	ZENER DIODE		
D10 -13			DSM1A1	DIODE		
D14 -17			1SS131	DIODE		
D14 -17			1SS178	DIODE		
D18 .19			1SS133	DIODE		
D18 .19			1SS176	DIODE		
D20 -22			1SS131	DIODE		
D20 -22			1SS178	DIODE		
IC1			NJM5532D	IC(ØP AMP X2)		
IC2			MS218P	IC(ØP AMP X2)		
Q1 -4			2SK369(V)	FET		
Q1 -4			2SK371(V)	FET		
Q1 -4			2SC2320(E,F)	TRANSISTOR		

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Q5 -10			2SC945(A)(Q,P)	TRANSISTOR		
Q11			2SA1110(Q,R)	TRANSISTOR		
Q12			2SC2590(Q,R)	TRANSISTOR		
Q13 -15			2SC2320(E,F)	TRANSISTOR		
Q13 -15			2SC945(A)(Q,P)	TRANSISTOR		
AUDIO UNIT (X09-2562-71)						
C5 .6			CK45FB2H102K	CERAMIC 1000PF K		
C7 -10			CF92FV1H683J	MF 0.068UF J		
C11 .12			CC45FSL1H101J	CERAMIC 100PF J	UMUE	
C11 .12			CD09FS1H101JZS	POLYSTY 100PF J	TE	
C13 -20			CE04KW2A010M	ELECTRO 1.0UF 100WV		
C25 -28			CK45FE2H103P	CERAMIC 0.010UF P		
C29 .30			CE04KW2A220M	ELECTRO 22UF 100WV		
C31			CE04KW1A101M	ELECTRO 100UF 10WV		
C32 .33			CE04KW2A010M	ELECTRO 1.0UF 100WV		
C34 .35			C91-0033-05	MF 1UF 100V		
C36 .37			CF92FV1H103J	MF 0.010UF J		
C38 .39			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C40			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C41 -48			CF92FV1H104J	MF 0.10UF J		
C49 .50			CC45FSL1H470J	CERAMIC 47PF J		
I05	2D		E23-0149-05	TERMINAL		
E1	2B		E11-0174-05	PHONE JACK (PHONES)		
N	1C,1D		N09-1236-05	TAPPING SCREW (Ø3X16)		
CP1 .2			R90-0187-05	MULTI-COMP 0.22X2 K 5W		
R1 .2			RN14BK2C4222F	RN 42.2K F 1/6W	TE	
R3 -10			RD14AB2E4R7JTS	FL-PR00F RD 4.7 J 1/4W		
R21 .22			RS14DB3D100JTE	FL-PR00F RS 10 J 2W		
R23 .24			RN14BK2C3160F	RN 316.0 F 1/6W	TE	
R27 .28			RS14DB3D331JTE	FL-PR00F RS 330 J 2W		
R29 .30			RS14DB3D151JTE	FL-PR00F RS 150 J 2W		
R31 .32			RS14DB3A151JTE	FL-PR00F RS 150 J 1W		
R37 .38			RD14AB2E100JTS	FL-PR00F RD 10 J 1/4W		
R39 -42			RD14AB2E101JTS	FL-PR00F RD 100 J 1/4W		
R43 -46			RD14AB2E100JTS	FL-PR00F RD 10 J 1/4W		
R54			RS14DB3A271JTE	FL-PR00F RS 270 J 1W		
R57			RD14AB2E101JTS	FL-PR00F RD 100 J 1/4W		
R58			RD14AB2E391JTS	FL-PR00F RD 390 J 1/4W		
R60			RS14DB3A562JTE	FL-PR00F RS 5.6K J 1W		
R63			RS14DB3A222JTE	FL-PR00F RS 2.2K J 1W		
VR1	3C		R10-5021-05	POTENTIOMETER(100K)VOLUME CONT		
K1			SS1-2075-05	MAGNETIC RELAY		
D1 .2			D5FB20*1	DIODE		
D3 .4			E-102	CONSTANT CURRENT DIODE		
D5 .6			HZS8.2S(B2)	ZENER DIODE		
D5 .6			RD8.2JS(B2)	ZENER DIODE		
D7			E-102	CONSTANT CURRENT DIODE		
D8			HZS8.2S(B2)	ZENER DIODE		
D8			RD8.2JS(B2)	ZENER DIODE		
D9 .10			HZS20S(B2)	ZENER DIODE		
D9 .10			RD20JS(B2)	ZENER DIODE		
D11 .12			1SS131	DIODE		

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# KA-D1100EX

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D11 ,12 IC1 ,2 IC3 ,4 Q1 ,2 Q3			1SS178 KAB02 TA2030 2SC2003(L,K) 2SC1845(F,E)	DIODE IC(DRIVER,POWER) IC(LB/HI SWITCHING) TRANSISTOR TRANSISTOR		
Q4 ,5 Q6 Q7 Q8 Q9			2SA954(L,K) 2SA992(F,E) 2SA1110(R,S) 2SC2632(Q,R,S) 2SA999(E,F)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
TONE UNIT (X11-2462-71)						
109	2B		A33-0098-04	REFLECTOR		
D1 ,2 D3 -7 D6 -12 D13 -15 D16	3B 3B 3B,3C 3B 3C		B30-1012-05 B30-1206-05 B30-1012-05 B30-1206-05 B30-1012-05	LED(SLP-981C-50)DAT/TAPE SEL LED (INPUT SELECTOR) LED(SLP-981C-50)NR, DAT, CD LED (DIGITAL INPUT SELECTOR) LED(SLP-981C-50)PLL LOCK IND		
D17 D19 PL1 -3	3C 3B 3C		B30-1206-05 B30-1012-05 B30-1212-05	LED LED(SLP-981C-50)POWER LAMP(BLU) DIGITAL, ANALOG		
C3 ,4 C5 ,6 C7 -10 C11 ,12 C13 ,14			CF92FV1H154J CF92FV1H333J CF92FV1H101K CF92FV1H105J CE04KW1H2R2M	MF 0.15UF J MF 0.033UF J MF 100PF K MF 1.0UF J ELECTRO 2.2UF 50WV		
C15 ,16 C17 -20 C21 -24 C25 -28 C29 ,30			CK45FB1H102K CF92FV1H393J CE04KW1C220M CF92FV1H684J CC45FSL1H221J	CERAMIC 1000PF K MF 0.039UF J ELECTRO 22UF 16WV MF 0.68UF J CERAMIC 220PF J		
C31 ,32 C33 ,34 C39 -42 C43 ,44 C51 ,52			CF92FV1H393J CF92FV1H101K CF92FV1H334J C91-0168-05 C90-1335-05	MF 0.039UF J MF 100PF K MF 0.33UF J POLYSTY 15PF K NP-ELEC 4.7UF 50WV	E	
C53 ,54 C55			CF92FV1H105J CF92FV1H103J	MF 1.0UF J MF 0.010UF J	E	
110 -	2B		J11-0111-05 J61-0039-05	CLAMPER WIRE BAND		
L1 ,2			L40-1021-14	SMALL FIXED INDUCTOR(1.0MH,K)		
R51 R59 R60 R61 R62		*	RD14GB2E102JTS RS14KB3D181JTE RS14KB3D182JTE RS14KB3D272JTE RS14KB3D181JTE	FL-PROOF RD 1.0K J 1/4W FL-PROOF RS 180 J 2W FL-PROOF RS 1.8K J 2W FL-PROOF RS 2.7K J 2W FL-PROOF RS 180 J 2W		
VR1 VR2 ,3	3C 3B		RD6-5166-05 RD6-2018-05	POTENTIOMETER (BALANCE)200KM POTENTIOMETER (BASS,TREBLE)5KB		
S1 S2 S3 S4 ,5 S6	3B 3B 3B 3B,3C 3C		S42-6022-05 S42-2160-05 S40-2351-05 S42-3106-05	MULTIPLE PUSH SWITCH(SELECTOR) MULTIPLE PUSH SWITCH(DAT/TAPE) MULTIPLE PUSH SWITCH(DAT,CD) PUSH SWITCH (MODE,SUBSONIC) MULTIPLE PUSH SWITCH(DIGI,ANLG)		

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S7 ,8 S9 S10 ,11 S12	3C 3C 3B 3B	*	S40-4074-05 S40-2366-05 S40-2351-05 S42-2161-05	PUSH SWITCH(LINE STRAIGHT,MUTE (LOUDNESS) PUSH SWITCH (TURNOVER) MULTIPLE PUSH SWITCH(SPEAKER)		
D18 D18 D20 -27 D20 -27 D28			1SS131 1SS178 1SS133 1SS176 HZS11N(B)	DIODE DIODE DIODE DIODE ZENER DIODE		
D28 IC1 Q1 -3 Q1 -3 Q4			RD11ES(B) NJM20410-D 2SC2320(E,F) 2SC945(A)(D,P) 2SA999(E,F)	ZENER DIODE IC(OP AMP X2) TRANSISTOR TRANSISTOR TRANSISTOR		
L1 -5			L33-0329-05	CHOKE COIL		
<b>PROCESSOR UNIT (X32-1202-71)</b>						
C1 ,2 C3 ,4 C5 ,6 C7 -10 C11 ,12			CQ09FS1H471JZS CQ09FS1H151JZS CQ93HP2A162G CQ93HP2A242G C91-0170-05	POLYSTY 470PF J POLYSTY 150PF J MYLAR 1600PF G MYLAR 2400PF G POLYSTY 22PF K		
C13 ,14 C15 ,16 C17 ,18 C19 ,20 C21 ,22			CQ93HP2A182G CQ93HP2A332G CQ93HP2A203G C91-0175-05 C90-1334-05	MYLAR 1800PF G MYLAR 3300PF G MYLAR 0.020UF G POLYSTY 56PF K NP-ELEC 47UF 10WV		
C23 -26 C27 ,28 C29 ,30 C31 ,32 C33 ,34			C91-0170-05 CQ93HP2A242G C91-0170-05 CQ93HP2A242G CQ93HP2A102J	POLYSTY 22PF K MYLAR 2400PF G POLYSTY 22PF K MYLAR 2400PF G MYLAR 1000PF J		
C41 -44 C41 -44 C45 C46 -49 C50 -53			CK45FF1H103Z CK45FF1H103Z CK45FB1H102K CF92FV1H103J CE04KW1C330M	CERAMIC 0.010UF Z CERAMIC 0.010UF Z CERAMIC 1000PF K MF 0.010UF J ELECTRO 33UF 16WV		
C54 ,55 C56 ,57 C58 ,59 C60 ,61 C62			CE04KW0J471M CE04KW0J471M CE04KW1A101M CE04KW1A470M CE04KW1C330M	ELECTRO 470UF 6.3WV ELECTRO 470UF 6.3WV ELECTRO 100UF 10WV ELECTRO 47UF 10WV ELECTRO 33UF 16WV		
C63 C64 -71 C72 ,73 C74 C76 ,77			CE04KW1A101M CE04KW1C330M CE04KW0J471M CE04KW0J331M CE04KW1C101M	ELECTRO 100UF 10WV ELECTRO 33UF 16WV ELECTRO 470UF 6.3WV ELECTRO 330UF 6.3WV ELECTRO 100UF 16WV		
C78 ,79 C80 ,81 C82 ,83 C84 ,85 C86 ,87			CE04KW1C330M CE04KW1A470M CE04KW0J471M CC45FSL1H080D CF92FV1H104J	ELECTRO 33UF 16WV ELECTRO 47UF 10WV ELECTRO 470UF 6.3WV CERAMIC 8.0PF 0 MF 0.10UF J		
C88 C90			C90-1350-05 CE04KW1A470M	NP-ELEC 2.2UF 50WV ELECTRO 47UF 10WV		

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C90 C91 ,92 C93 ,94 C95 ,96 C97			CF92FV1H184J CF92FV1H102J CC45FSL1H151J CQ09FS1H101JZS CF92FV1H822J	MF 0.18UF J MF 1000PF J CERAMIC 150PF J POLYSTY 100PF J MF 8200PF J		
C98 C99 -106 C107-110 C111,112 C113			CE04KW1A101M CK45FF1H103Z CE04KW1E222M CE04KW1E221M CE04KW1A101M	ELECTRO 100UF 10WV CERAMIC 0.010UF Z ELECTRO 2200UF 25WV ELECTRO 220UF 25WV ELECTRO 100UF 10WV		
C114,115 C116,117 C119,120 C121,122 C124			CE04KW1C330M CE04KW1C332M CE04KW1C332M CK45FF1H103Z C91-0733-05	ELECTRO 33UF 16WV ELECTRO 3300UF 16WV ELECTRO 3300UF 16WV CERAMIC 0.010UF Z CERAMIC 33PF J		
I05 E1	1B,1C 1C		E23-0149-05 E13-0484-05	TERMINAL PHONE JACK (COAXIAL)		
L1 ,2 L3 L4 ,5 L6 -9 L10 -15		*	L40-4701-16 L39-0142-05 L39-0154-05 L40-1021-11 L33-0328-05	SMALL FIXED INDUCTOR(47UH,K) MATCHING COIL VARIABLE INDUCTOR SMALL FIXED INDUCTOR(1.0MH,K) CHOKER COIL		
L16 ,17 L18 ,19 X1 X2			L40-1021-11 L40-1092-16 L77-1130-05 L77-1129-05	SMALL FIXED INDUCTOR(1.0MH,K) SMALL FIXED INDUCTOR(1UH,M) CRYSTAL RESONATOR CRYSTAL RESONATOR		
CP1 R1 ,2 R3 ,4 R7 ,8 R9 ,10			R90-0233-05 RN14BK2C9092FTS RN14BK2C1963FTS RN14BK2C1621FTS RN14BK2C1002FTS	MULTI-COMP 10KX4 J 1/6W RN 90.9K F 1/6W RN 196K F 1/6W RN 1.62K F 1/6W RN 10.0K F 1/6W		
R11 ,12 R13 -16 R17 -20 R21 ,22 R23 ,24			RN14BK2C1001FTS RN14BK2C6811FTS RN14BK2C1002FTS RN14BK2C1003FTS RN14BK2C9092FTS	RN 1.00K F 1/6W RN 6.81K F 1/6W RN 10.0K F 1/6W RN 100K F 1/6W RN 90.9K F 1/6W		
R25 ,26 R27 ,28 R29 ,30 R31 -42 R43 ,44		*	RN14BK2C1961FTS RN14BK2C6341FTS RN14BK2C1961FTS RN14BK2C3241FTS RN14BK2C9092FTS	RN 1.96K F 1/6W RN 6.34K F 1/6W RN 1.96K F 1/6W RN 3.24K F 1/6W RN 90.9K F 1/6W		
R45 ,46 R47 ,48 R49 ,50 R51 ,52 R53 ,54		*	RN14BK2C1621FTS RN14BK2C8250FTS RN14BK2C1001FTS RN14BK2C1211FTS RN14BK2C10R0FTS	RN 1.62K F 1/6W RN 825.0 F 1/6W RN 1.00K F 1/6W RN 1.21K F 1/6W RN 10.0 F 1/6W		
R55 ,56 R59 -98 R99 -102 R103,104 VR1 ,2			RN14BK2C1003FTS RN14BK2C1003FTS RN14BK2C1472FTS RD14GB2E220JTS R12-1100-05	RN 100K F 1/6W RN 100K F 1/6W RN 14.7K F 1/6W FL-PR88F RD 22 J 1/4W TRIMMING P8T. (2.2KB) OUT PUT		
VR3 ,4 VR5 ,6		*	R12-3147-05 R12-1099-05	TRIMMING P8T. (47KB) DISTORSION TRIMMING P8T. (1KB) DISTORSION		

E: Scandinavia &amp; Europe K: USA P: Canada

U: PX(Far East, Hawaii) T: England M: Other Areas

UE: AAFES(Europe) X: Australia

△ indicates safety critical components.

## PARTS LIST

\* New Parts

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Les articles non mentionnés dans le Parts No. ne sont pas fournis.

Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
K1 ,2 S1	1C		S51-2074-05 S31-2095-05	MAGNETIC RELAY SLIDE SWITCH (DAC)		
PH1			T95-0101-05	OPTO ISOLATOR		
D1 -24 D1 -24 D27 -29 D27 -29 D32			1SS133 1SS176 1SS133 1SS176 HZ55.1S(B2)	DIODE DIODE DIODE DIODE ZENER DIODE		
D32 D33 -40 D41 ,42 D43 D43			RD5.1JS(B2) DSM1A1 KV1310-1 HZ52.7N(B2) RD2.7ES(B2)	ZENER DIODE DIODE VARIABLE CAPACITANCE DIODE ZENER DIODE ZENER DIODE		
D44 -57 D44 -57 IC1 ,2 IC3 -10 IC21,22			1SS133 1SS176 PCMS6P-K NJM5532D-D TC74HC04F	DIODE DIODE IC(DA CONVERTER) IC(OP AMP X2) IC(HEX INVERTER)		
IC23,24 IC25 IC26 IC27 IC28			TC74HC153F SM5804D-T TC176005AF-0053 M5223P MSF78M05L	IC(4CH MPX) IC(DIGITAL FILTER) IC(VCXO) IC(OP AMP X2) IC(VOLTAGE REGULATOR/ +5V)		
IC29 IC30 IC31 IC32 IC33			MSF79M05L MSF78M06L MSF79M06L P005R04 M5220P	IC(VOLTAGE REGULATOR/ -5V) IC(VOLTAGE REGULATOR/ +6V) IC(VOLTAGE REGULATOR/ -6V) IC(VOLTAGE REGULATOR/ +5V) IC(OP AMP X2)		
IC34 IC35 01 -4 05 05			TC74HC04F MS1751ASL 2SC1923(R,θ) 2SC2320(E,F) 2SC945(A)(O,P)	IC(HEX INVERTER) IC(SYSTEM RESET) TRANSISTOR TRANSISTOR TRANSISTOR		
06 07 08 010 -13			2SD1266(O,P) 2SB941(O,P) 2SK170(BL,V) DTC114YFF	TRANSISTOR TRANSISTOR FET DIGITAL TRANSISTOR		
A1 A2 ,3	1C 1C		W02-0784-05 W02-0774-05	ELECTRIC CIRCUIT MODULE(REC) ELECTRIC CIRCUIT MODULE(PLA,CD)		
<b>DIGITAL I/O UNIT (X88-1010-00)</b>						
C1 C2 C3 C4 C5			CC45FSL1H270J CF92FV1H273J CF92FV1H272J CF92FV1H683J C90-1602-05	CERAMIC 27PF J MF 0.027UF J MF 2700PF J MF 0.068UF J NP-ELEC 10UF 10WV		
C6 C7 C8 -10 C11 -14 C15			CF92FV1H103J CE04JW1H010M CE04JW1A101M CK45FF1H103Z CC45FSL1H100D	MF 0.010UF J ELECTRO 1.0UF 50WV ELECTRO 100UF 10WV CERAMIC 0.010UF Z CERAMIC 10PF D		
L1 ,2			L92-0018-05	FERRITE CORE		
R4 ,5			RD14AB2E100JTS	FL-PROOF RD 10 J 1/4W		

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D1 D2 -10 D2 -10 IC1 IC2			1SS237(1) 1SS133 1SS176 TC176014AF-0073 SN74LS624N	DIODE DIODE DIODE IC(DIGITAL IN) IC(VCXO)		
IC3 IC4 IC5			M5223P TC74HC04F TC74HC123F	IC(OP AMP X2) IC(HEX INVERTER) IC(DUAL MONO MULTI)		
<b>COMPOUND ASS'Y UNIT (X90-2672-71)</b>						
C	1B		N09-0301-05	TAPTITE SCREW (Ø3X8)		

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## SPECIFICATIONS

## &lt; Power Output &gt;

125 watts per channel minimum RMS, both channels driven, at 8 ohms from 20 Hz to 20,000 Hz with no more than 0.004% total harmonic distortion

Maximum Continuous Power Output (DIN) 1 kHz at 4 ohms	190 W
Maximum Continuous Power Output (DIN) 1 kHz at 8 ohms	150 W
Maximum Continuous Power Output (IEC/NF) from 63 Hz to 12,500 Hz, 0.7%	
Total Harmonic Distortion at 8 ohms	150 W + 150 W
Dynamic Power	150 W per channel at 8 ohms 270 W per channel at 4 ohms 325 W per channel at 2 ohms

## Total Harmonic Distortion

## LINE input to SPEAKER output

(20 Hz ~ 20,000 Hz)	: 0.004% at rated output power at 8 ohms
(20 Hz ~ 20,000 Hz)	: 0.003% at 1/2 rated output power at 8 ohms
(1 kHz)	: 0.0006% at rated output power at 8 ohms

## Intermodulation Distortion (60 Hz:7 kHz = 4:1)

: 0.004% at rated output power

## Frequency Response

## LINE to SPEAKER

: 1 Hz to 180 kHz/ +0 dB, -3 dB

## PHONO "RIAA" Response PHONO

: 20 Hz to 20 kHz/  $\pm 0.3$  dB

## Signal to Noise Ratio (IHF-A) (IHF'66)

## PHONO (MM)

: 87 dB

## PHONO (MC)

: 70 dB (0.25 mV)

## TUNER/AUX/TAPE

: 108 dB

## Signal to Noise Ratio (IHF-A)

## PHONO (MM)

: 78 dB

## PHONO (MC)

: 74 dB

## TUNER/AUX/TAPE

: 82 dB

## Signal to Noise Ratio Unweighted: 50 mW input (DIN)

## PHONO (MM)

: 58 dB

## TAPE/AUX/TUNER

: 60 dB

## Power Bandwidth

: 5 Hz to 50 kHz at 0.04% T.H.D., 8 ohms

## Subsonic Filter

: 6 dB/Oct. at 18 Hz

## Tone Control

## BASS (at 200 Hz)

:  $\pm 10$  dB

## (at 400 Hz)

:  $\pm 10$  dB

## TREBLE (at 3 kHz)

:  $\pm 10$  dB

## (at 6 kHz)

:  $\pm 10$  dB

## Loudness Control (at -30 dB Volume Level)

: 9 dB at 100 Hz

## Damping Factor

: 1,000 (50 Hz at 8 ohms)

## Input Sensitivity/Impedance

## PHONO (MM)

: 2.5 mV/ 47 kohms

## PHONO (MC)

: 0.2 mV/100 ohms

## TUNER/AUX/TAPE

: 150 mV/ 47 kohms

## Phono Maximum Input Level (PHONO to TAPE REC)

## (MM)

: 200 mV, at 1 kHz

## (MC)

: 15 mV, at 1 kHz

## Output Level/Impedance

## TAPE REC (Pin)

: 150 mV/330 ohms

## &lt; D/A Converter Section &gt;

## Input Sampling Frequencies

: 32 kHz/44.1 kHz/48 kHz

## Signal to Noise Ratio

: 108 dB

## Total Harmonic Distortion

: 0.0025% at 1 kHz

## Channel Separation

: 103 dB at 1 kHz

## Digital Inputs

: Optical: -15 ~ -25 dBm

Coaxial: 0.5 Vp-p/75 ohms

DAT Monitor 0.5 Vp-p/75 ohms

Optical: -15 ~ -25 dBm

Coaxial: 0.5 Vp-p/75 ohms

## Digital Output

## &lt; General &gt;

## Power Consumption

: 350 W

## Dimensions

: W 440 mm (17-5/16")

H 171 mm (6-3/4")

D 441 mm (17-3/8")

: 19.5 kg (42.9 lb)

## Weight (Net)

## &lt; Accessories &gt;

## RCA pin-plug cord

: 1

## Optical fiber cable

: 1